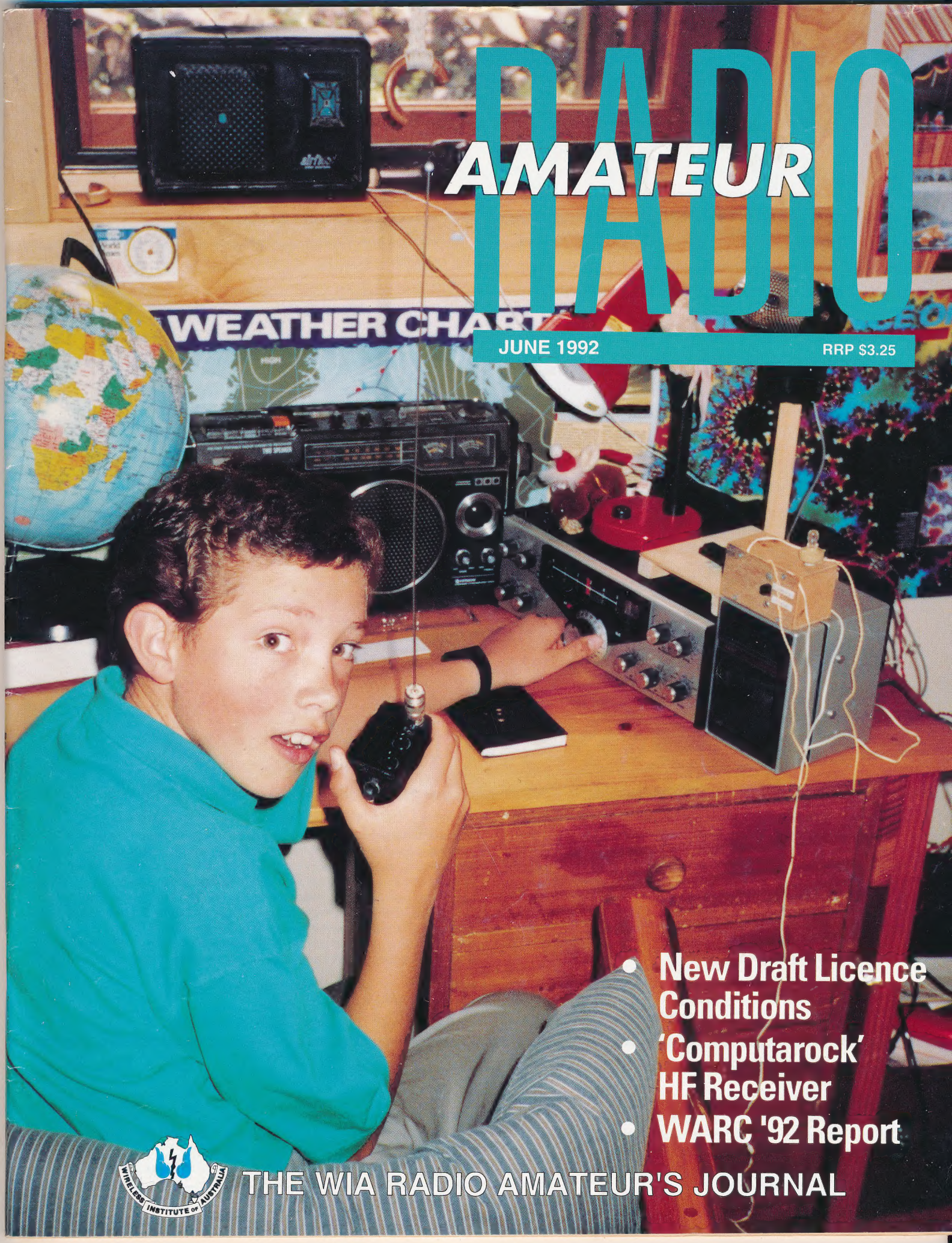

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- New Draft Licence Conditions
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- WARC '92 Report

THE WIA RADIO AMATEUR'S JOURNAL

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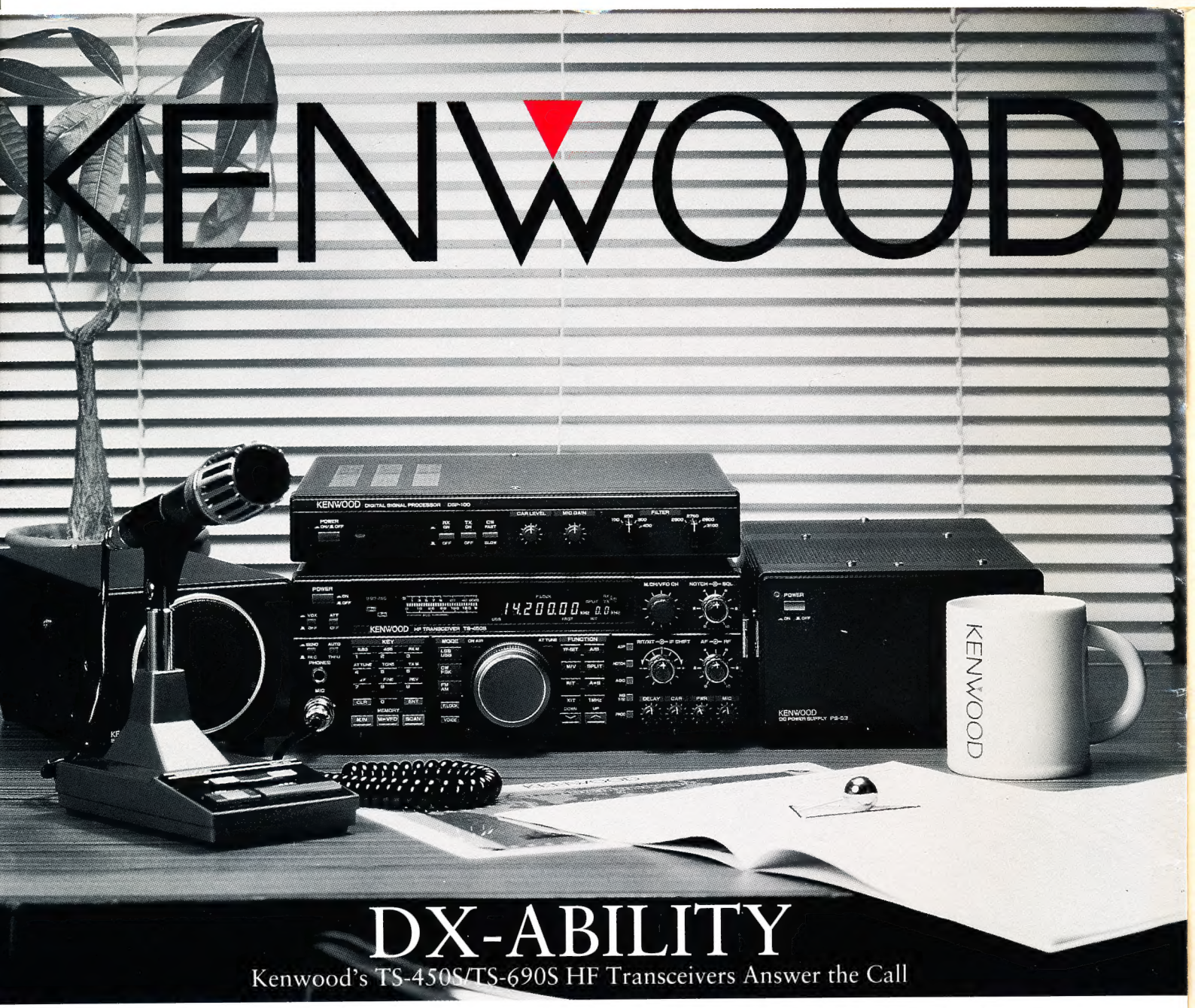

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 60 No 6 ISSN 0002-6859 June 1992

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Cover

James Brinkhoff VK7PAN aged 12 is pictured at the controls of his rig in Kelso, Northern Tasmania. Age information is not held in the office records, so we wonder if James is the youngest-ever licensed VK amateur and full member of the WIA? Read the complete story by Don Cripps VK7AY on page 16. Photo by James' dad, Stephen Brinkhoff.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society
Founded 1910

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Videotapes:	John Ingham	VK5KG
WARC & CCIR	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

Editor's Comment

Bill Rice VK3ABP Editor

Tempora Mutantur

Et nos mutamur in illis. The times are changed, and we are changed with them. "This time he's really flipped," you say. "Do we need Latin tags in *Amateur Radio?*". Yes, you're probably right. But, on the other hand, how very true it is. And we should never forget completely that ancient language on which so much of our own is based.

All of this was sparked off by looking back through the minutes of earlier Federal Conventions. There is an account of the 1992 Convention in this month's WIANEWS, beginning on the next page. I have the bound minutes of all that have been held from 1982 onwards, only 10 years ago, but a great deal has happened since. That was the year in which I first attended a Federal Convention, in my new official capacity as Chairman of FTAC. Peter Wolfenden VK3KAU was the Federal President, David Wardlaw VK3ADW the immediate Past President, and Ron Henderson VK1RH the VK1 Federal Councillor. These three people were also at this year's Convention, and Ron is our new Federal President. Brenda Edmonds VK3KT was also there in 1982 as Federal Education Co-ordinator, and Neil Penfold, then as now, was the VK6 Federal Councillor. But every other person present in 1982 was no longer involved this year. Twenty-eight different faces this time!

Even at the 1985 Convention (the first at which I was listed as Editor) there were 30 people present who are no longer in the Federal scene. The rate of turnover is rather frightening, isn't it? And yet, somehow, you still seem to be stuck with the same old Editor! Just plain "Editor", not Executive Editor, as we now have a Federal Management Group, and Executive is no more.

There is one thing which doesn't change as far as this magazine is concerned, and that is our need for a good regular supply of technical articles. We still have quite a few in the queue, but they are starting to be published faster than new articles are arriving. You have all done a marvellous job of keeping up the supply for some years now, and we're not yet by any means desperate! But if you have had the germ of a tech article lurking in the back of your mind for a while, now is the time to encourage its growth! We still have a fair supply of non-technical articles, but we do like to keep the balance somewhere near right.

By the time you read this, a two-vehicle convoy containing VK3OM and VK3ABP and XYLs should be approaching far north Queensland. We expect to be active on at least 80, 40 and 20 metres, and will be stopping overnight in such places as Longreach, Karumba and Mt Isa before crossing over into VK8, up to Darwin, and then back down to Adelaide about 11 July. Incidentally, the carburettor problem, mentioned in my April blurb, was the automatic choke. A retainer clip had disappeared, allowing the choke linkage to jam now and then in the closed position. What will the next problem be?

ar

WIA News

From the WIA Executive Office

WIA 56th Federal Convention

The 56th Federal convention of the WIA was held at the Brighton Savoy Motel over the weekend of 2nd and 3rd May 1992. The following persons attended:

Federal Councillors

Rob Apathy VK1KRA, Terry Ryeland VK2UX, Peter Maclellan VK3BWD, Murray Kelly VK4AOK, Bill Wardrop VK5AWM, Neil Penfold VK6NE, and Jim Forsyth VK7FJ.

Alternate Federal Councillors

Hugh Blemings VK1YYZ, Roger Harrison VK2ZTB, Barry Wilton VK3XV, David Jones VK4OF, and Ian Watson VK5KIA.

Executive members

Peter Gamble VK3YRP (Federal President), Ron Henderson VK1RH (Vice-Chairman of Council), Kevin Olds VK1OK, David Wardlaw VK3ADW (Immediate Past President) and Bill Rice VK3ABP (Editor).

Observers

John Nunan VK3IC, Peter Wolfenden VK3KAU, Clive Sait VK4ACC, Ted Doell ZL1BQA, Anne McMaster ZL3VR and Ron McMaster ZL3MQ.

Federal Office

Bill Roper (General Manager/ Secretary) and Brenda Edmonds VK3KT (Assistant Manager).

Peter Gamble opened the meeting just after 9 am on Saturday, initially in Executive mode, to deal with correspondence and reports. This was mostly routine, but one interesting item was the report by Ron Henderson on his visit to RSGB headquarters while on the way home from WARC-92.

Near midday, Executive business was adjourned until Sunday, and the meeting formally became the 56th Convention of Federal Council.

Giving his Presidential report, Peter surveyed the administrative changes and increasing responsibilities which have evolved during his four years as Federal President. He also foreshadowed his retirement from the chair. A highlight of the reports to Council was that by Ron Henderson and David Wardlaw on their participation in WARC-92. As reported elsewhere in this issue this WARC produced no significant changes in the spectrum available to the Amateur Service.

At this stage Peter handed over the chair to Ron, as business commitments required him to be elsewhere for the rest of the day, exemplifying the demands on his time which have forced his resignation from Executive.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram St Parramatta NSW (PO B ox 1066) Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100-1400 Wed 1900-2100)	VK2ZIG VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Ken Ayers David Travis	VK4QA VK4KD VK4ATR
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland-Thomas	VK6LZ VK6AFA VK6OO
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne Tas 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts	1992 Fees	
3.570MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only) 1.845 AM; 3.595 AM morning and SSB evenings; 7.146 AM*; 10.125 SSB; 24.910 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; 1281.750 FM; On relay on behalf of VK2WI on 18.120 SSB; 584.750 ATV Sound, Ch 35, Sydney region. Plus automatic relays to 2m repeaters surrounding Sydney and manually to many country repeaters. News headlines by phone (02) 552 5188; General Divisional information (02) 651 1489.		
1.840MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura 146.700 FM (R) MT. Dandenong 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296. 100 0900 hrs Sunday Repeated on 3.605 & 147.150MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820kHz 3.550MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555M 146.500, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525MHz. Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 146.700 at 1900 hrs	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades

Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

REORGANISATION

After dealing with most of the reports to Council, Ron asked Rob Apathy to introduce a proposal by the VK1 Division for re-organisation of the WIA which was foreshadowed at the last quarterly meeting *(Amateur Radio* March 92 page 5). This proposal was the result of much discussion between VK1, 2 and 3 and also with legal Counsel. It is an attempt to remedy the situation perceived by some Divisions that Council, by delegating power to Executive, has become less effective ("the Executive tail wagging the Council dog").

The proposal does two things:

Firstly, by simple changes to two of the Articles of Association, it abolishes the Executive in its present form;

Secondly, it vests responsibility for the majority of the work hitherto done by Executive in a Federal Management Group. Those members of the previous Executive who also served as directors of the WIA will cease to be directors. The only directors will be the seven Federal Councillors plus the Federal President, who is chosen by Council, but need not previously have been a Councillor.

DOTC REPRESENTATIVES

The re-organisation debate was adjourned to deal briefly with most of the remaining reports to Council, and then to welcome to the Convention the two representatives from the Department of Transport and Communications. These were:

Ms Gwen Andrews, Assistant Secretary and

Mr David Hunt, Director, Licensing, both from the Radiocommunications Operations Branch of the Department.

Gwen Andrews spoke first about the Parliamentary Enquiry into Management of the RF Spectrum, which was recently completed but has yet to be presented to Cabinet. She assured us that none of its recommendations need be feared by the Amateur community.

David Hunt announced a number of changes to the regulations as part of the continuing deregulatory program. (These are published in this issue of *Amateur Radio* magazine.) David stressed the importance of the input received by the DoTC from the WIA and the desire to encourage flexibility and ease of entry to the Amateur Service without inhibiting the development of new technology. He also noted the decreasing resources of the DoTC, and the fact that amateur licences make up less than 1 % of the total number of licences under control of DoTC, which inevitably means that the time and resources devoted to the Amateur Service are limited. In these circumstances, there is no place for rules which cannot be administered.

The changes will probably become effective later this year, or early next year, after a period of "active consultation" with the amateur public. One very significant change is the introduction of a Novice Limited licence class, permitting use of FM phone (only between 146 and 148 MHz) but requiring no Morse code qualification.

Many questions were addressed to Gwen and David regarding various aspects of amateur activity and administration. All were answered honestly and thoughtfully, admitting in some cases that they did not have the answer either! On that note the meeting adjourned to dinner, where we were delighted that the DoTC representatives had accepted the invitation to join us. Another dinner guest was Maggie Iaquinto VK3CFI, the winner of the 1991 Ron Wilkinson Achievement Award who, on behalf of the VK3 Division, received the 1991 Remembrance Day Trophy from Neil Penfold VK6NE, the Federal Contest Co-ordinator.

OTHER BUSINESS

The meeting re-opened on Sunday, again under the chairmanship of Peter Gamble, in Executive mode to deal with a range of agenda items. These included international liaison, examination service progress (very gratifying), repeater linking, options for the future production of Amateur Radio magazine, spread spectrum modes, suggestions for an opening speaker for the 1992 Remembrance Day Contest, the Amateur Service responsibility to publicise the increasing number of systems contributing towards pollution of the RF spectrum, and a number of more minor items.

RE-ORGANISATION AGAIN

The principal business on Sunday afternoon was, again as Council, to continue the debate on re-organisation. Six agenda items were involved in setting up the machinery to abolish the Executive and revise the management of the WIA. The first five were carried unanimously with very little debate, and the sixth was withdrawn, as acceptance of the others rendered it irrelevant. One clause was added to the fourth motion, empowering the General Manager to set up the new Federal Management Group to supersede Executive.

NEW PRESIDENT, SAME COUNCIL

It was moved by VK3, seconded VK1, that the incoming Federal President should be Ron Henderson VK1RH. This was carried unanimously. Ron has been a very competent Vice-Chairman for some years, so was seen to deserve promotion to the chair! The seven Federal Councillors were unchanged, as listed earlier.

G A TAYLOR MEDALLIONS

One of the last items agreed to before the election was that G A Taylor Medallions (the WIA's highest award short of Life Membership) should go to David Wardlaw VK3ADW, Peter Gamble VK3YRP and Wally Watkins VK4DO, for years of service to the WIA in many capacities. Thus it was that one of Ron's first duties as President was to make the awards of these medallions to the two nominees actually present (VK3ADW and VK3YRP). The third medallion was accepted by Murray VK4AOK, on behalf of the Queensland Division, for later presentation to VK4DO. On this happy note the 56th Convention concluded just after 3.30 pm.

ARRL DXCC News Release

An interesting circular has been received from the ARRL and is being publicised in order to allow radio amateurs the opportunity to comment on matters under consideration by the ARRL DX Advisory Committee.

New DXCC Country Actions:

• Vatican enclave of the Holy House (HV0HH) was rejected for new DXCC country status by a vote of 15 - 0.

The following are under consideration for new DXCC country status:

• Add Pratas Island (21N 117E) - waiting further information and a formal application.

Make Ceuta and Malilla (EA9) two separate countries - based on Rule 3, separation by another DXCC country.

The following are under consideration for DXCC deleted country status:

• Spratley Is (1S) - based on no longer meeting criteria.

• South Sudan (ST0) - based on no longer meeting criteria.

The following questions are under consideration:

• Should electronic confirmations be acceptable for DXCC credit?

• Should separate DXCC country status for the Vienna International Centre (4U1VIC) be reconsidered?

• What are appropriate guide-

lines and procedures for DX operations - particularly DXpeditions to rare countries?
• Should contacts with stations on docked ships count for DXCC credit?
• What does the future hold for DX and DXCC?

Further News from WARC 92

Ron Henderson VK1RH, one of the WIA delegates at WARC 92 advises that the Canadian WARC 92 delegation provided a couple of conference documents on Digital Audio Broadcasting experiments they had conducted to determine the characteristics of typical systems. They had used UHF and 1.4 GHz signals including a synthesised satellite path.

By digital Audio Broadcasting or DAB we mean the digitisation of a signal as close to the source as possible and its passage in digital form to the listener's receiver. Of course compact discs are already in digital format and can be readily accepted into the system. As a matter of interest the Canadian experimental system employed a fully digital studio control panel. Perhaps it was akin to a mini telephone exchange!

By multiplexing or combining several digital signals into one composite modulating signal, a multi -channel as well as a stereo system can be obtained. This has many advantages such as multiple stereo channels from the one transmitter.

The WARC considered DAB, both in its terrestrial and satellite forms, which were seen as complementary, as a development worthy of receiving consideration in the "carve up" of precious spectrum. It is expected terrestrial systems, possibly co-located with existing UHF TV installations, will shortly come into service to demonstrate DAB's capabilities.

Those of you experienced with modern digital telephone systems may ask how do you tune in a system which has, in practice, no background noise?

So what's in it for the amateur service? Well, the increasing availability of receivers will serve as an impetus for experimenters to build digitisers and transmit digital speech signals. No doubt the IC chip sets exist. After all the technology is not new, at least for the digital to analogue path, being included in every CD player!

How could we amateurs use a version of DAB? Perhaps to provide an audio channel in parallel with one or more data channels. No great gains for packet you might think, except for engineering and experimentation, that's true. But suppose you are a real computer buff, transferring computer files of data and software on air with a friend who has similar interests. You could conduct duplex speech liaison traffic in parallel with your data and not clog up the local repeater as is inclined to happen today.

The WIA will be examining this mode of modulation, that is broad band or high data rate signals, to ensure the Australian amateur is able to experiment with it.

Changed Your Address or Callsign?

Most WIA members are very good about notifying the Executive Office of changes to their addresses or their call sign. The reverse side of the address label flysheet in each copy of Amateur radio magazine is designed to make this easy for you.

However, a few members recently have sent in only the end section with the new details on it, and not the whole sheet, making it time consuming to work out who it has come from and what has to be changed. Please reduce the stress on the membership secretary and provide BOTH the old and the new information when advising of any changes in your details.

Death of ORARI President

Letters from Masayoshi Fujioka, Secretary of the IARU Region III, and David Rankin, President of the IARU Region III, announce with deep regret the unexpected death of Mr Barata YB0AY, President of ORARI, the Indonesian host society of the IARU regional conference held in Bandung during October last year. This is a sad loss to both ORARI and the IARU. The WIA extends condolences to its sister society, and the family of the deceased.

IARU 1992 ARDF World Championships

The 6th IARU Amateur Radio Direction Finding World Championships 1992 will be held in Hungary, hosted by the Hungarian Amateur Radio Society, from 8th to 12th September 1992. Unfortunately this notice did not reach the WIA until two weeks after the closing date for entries to be received.

Amateur Radio Magazine

What is your magazine to you? How does the "average" amateur see this magazine? Is it a source of up-to-date technical information, a collection of irrelevant trivia, light entertainment, a sales pitch, a trading centre, a contests/awards guide, a social calendar, a newsletter or a gossip column?

Surveys at various times have highlighted the vast range of expectations among readers, and a similar range of perceptions, but members are getting just about all of the above, and maybe more. Not every issue of *Amateur Radio* magazine includes them all, but over a few issues a wide range of interests is satisfied. But are our readers content with the present situation?

The WIA sees the magazine as a forum for its members to contribute technical, or general interest articles, to air their views on operating techniques, regulatory procedures or published items, etc.. Feedback from a range of sources confirms the high standing of *Amateur Radio* magazine among similar publications world wide. It is quoted from and used as a reference in many other journals.

Despite comments recently in this column about the delay between receipt of an article and its actual publication, the Publication Committee is always pleased to receive articles or other items for consideration for publication. In the attempt to please all readers, and to produce a reasonably balanced magazine, the Editors need to have plenty of items ready for use.

There are some contributors who submit items frequently, but I am sure many members could manage an occasional article or story. The space distribution is based on member input and interest, in particular on responses when asked which articles and columns are read. If you are not satisfied with the present system, there are two approaches you can take:

A. Do something about it such as writing and submitting articles or comments, or encouraging others to do likewise.

B. Voice your concerns in the places where it can have some effect. There is no point in criticising the magazine on the local repeater if you are not prepared to make the effort to pass your comments direct to the Publications Committee.

As in many fields, the voices of the critics are louder than those of the supporters. But it is significant to note that, three years after the introduction of the X Grade membership, which does not include the sup-

ply of a magazine, the members taking this option comprise less than 7 % of the total membership.

Often members approach the WIA with "Why don't you.. ?" ideas, suggestions for special columns, articles, or reports, or general ideas on changes to the layout or emphasis. This is great. All ideas are welcome, and are discussed by the Publications Committee. But the implementation usually requires someone to do the extra work. It would be even better if the idea came equipped with the offer of action.

Exams Update

As at the 30th April 1992 there were just over 300 Accredited Examiners listed with WIA Exam Service. Of these, 168 have conducted examinations on one or more occasions.

It is understandable that the two figures do not tally - many examiners may intend to conduct only one examination per year, say at the end of a course, and it is possible that a number arranged accreditation to assist with club activities, or simply to be able to be kept up-to-date with procedures as time goes by.

At times rumours are heard that the service supplied by the examiners is less than satisfactory, or that an examiner has stated that he does not intend to conduct further examinations. As WIA Exam Service is keen to keep its records up-to-date, we would appreciate being told directly of any examiners who have stated their intention not to examine, so that we can obtain confirmation from them and adjust the lists accordingly. In that way, they will not be bothered by enquiries from recruits asking for assistance or examinations.

Examiners who have not conducted an examination in the previous 18 months will be deleted from the published lists automatically, but may be reinstated on request. It is perhaps worth reminding members that remote candidates can be examined as easily as those in the suburbs. It is up to the candidate to find two acceptable supervisors - other amateurs, or persons from the categories on the published list - who are prepared to administer the examination on a "once-off" basis. For these persons, no accreditation fee is payable.

1991 JOTA Report

Each year the WIA receives a copy of the International Jamboree Of The Air report, compiled by the World Organisation of the Scout Movement in Geneva. The 1992 JOTA report has just been received.

It is an impressive document of 38 pages, with extracts from the reports submitted by each country, and comments on the activities involved in the 1991 JOTA held on 19-20th October 1991. The statistics show that the JOTA is still gaining strength - over 386,000 JOTA participants used 12,367 radio stations staffed by over 33,000 amateurs, with a tally of 99 countries participating.

Particularly noteworthy were the newly established scout stations from eastern-European countries, and the enthusiasm of the countries for submitting reports to Geneva. The latter of course was stimulated by a competition for the best report, a competition won by Mexico, with Australia second and Oman third. According to the figures, 21.5% of Australian scouts/guides participated, contacting 48 countries. Note was made of the satellite links provided by AUSSAT, and also various contacts with MIR.

This year, the 35th JOTA will be held over the weekend of 17 - 18th October, with the theme "Let's talk".

ITU News

A press release from the International Telecommunications Union advises that:

"The instrument of accession of the government of Azerbaijan has been deposited with the International Telecommunications Union (ITU) on 10th April 1992, making that country the 167th member.

The accession of Azerbaijan follows that of Lithuania (12th October 1991) and Latvia (11th November 1991). The former USSR Republics of Belarus and Ukraine have both been members since 7 May 1947".

This notice was followed a few days later by a similar announcement about Estonia becoming the 168th member of the ITU. Estonia is situated on the Baltic Sea, North of Latvia and bounded on the east by Russia.

The ITU has also recently announced the establishment of a World Telecommunications Advisory Council, comprising senior representatives of the Telecommunications industry. The intention of the Council is for it to provide advice to the ITU on its activities and recommendations for the worldwide development of information technology, as well as raising the awareness of the importance of investment in telecommunications.

Spread Spectrum Transmissions

So-called "Spread Spectrum" communications modes have come to prominence in amateur radio over the past decade, although the technique, as a possible amateur mode, was mooted as early as the mid-1950s (see a QST article, "Poisson, Shannon and the Radio Amateur").

The following concise definition was supplied courtesy of Dave Horsfall, VK2KFU/VK2SSG.

As the state of the art currently stands, there are three main modes:

1. CHIRP: the transmission frequency is swept up and down a wide band. (Not an approved "legal" mode);
2. FREQUENCY HOPPING: the frequency "hops" to predefined (pseudo random) frequencies at high speed, staying on each frequency for less than 0.1 secs (usually much less);
3. DIRECT SEQUENCE ("true" spread spectrum): the transmission is modulated with a digital pseudo-random binary pattern, causing it to occupy great bandwidth, but the power in any typical "window" is below the noise floor.

Technically, spread spectrum is a "wide-band" mode and is only permitted to amateur radio operators in Australia above 420 MHz only.

D-I-Y Radio

Last year *Amateur Radio* magazine published a review of "D-I-Y Radio", a new publication by the RSGB aimed at the beginners in amateur radio, which is published six times a year. We have recently received advice on subscription procedure. It is available to overseas subscribers for Pounds (Sterling) 12.18 per year, from DIY Radio, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE UK.

The March-April issue contains instructions for building a BFO, simple explanations of capacitors and wave motion, a kit review, readers letters, and other minor news items. This could be a useful publication for any beginner in radio theory.

SEANET '92

Amateur Radio magazine last month published a small advertisement for SEANET '92, which is to be held in Darwin from 29th October to 1st November 1992. SEANET is a group of radio amateurs spread around Northern Australia and south-east Asia who hold regular skeds, and

hold an annual Convention. This year will be the first time the Convention has been held in Australia. The publicity being received at the Federal Office invites all interested parties to attend. Further information can be obtained by writing to Jim Jones, VK8LJ, Secretary, SEANET '92, PO Box 37173, Winnellie, NT 0821.

New IARU Members

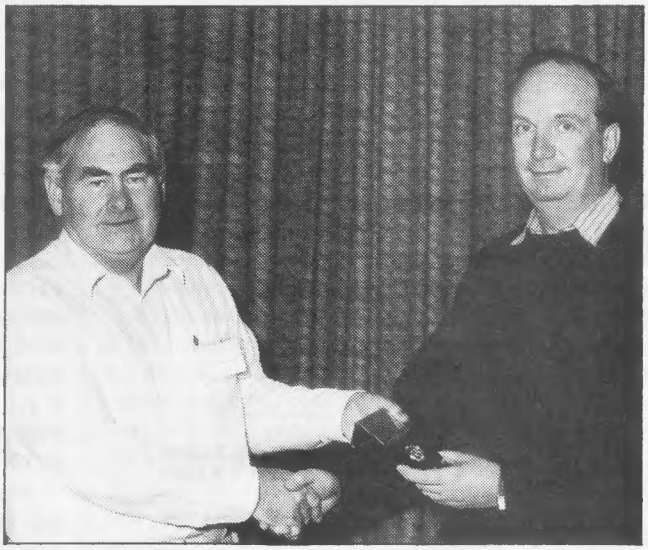
International voting has just agreed that the Namibian Amateur Radio League should be admitted to membership of the IARU, making a total of 128 members. There is also a proposal in circulation to admit the Chinese Taipei Amateur Radio League to membership.

Written That Article Yet?

Although at the present moment the Editor of Amateur Radio magazine holds a reasonable stock of articles for future publication, it has been noted that the number of articles being received has dropped over the last few weeks. Perhaps there was a spate of writing by members over the New Year holiday period which has now dried up. Now may be the time for you to do something about that article you have always intended to write. Technical or general interest, serious or humorous, long or short will be acceptable. The Editor likes to have a variety on hand in order to be able to select by style, topic and length in the perpetual quest for a high quality, balanced magazine.

Regulations Brochures Changes

In conjunction with the rewrite of the amateur service licence conditions, published later in this issue, the DoTC have reprinted brochures RIB 70 and RIB 72 with some minor changes recommended by the WIA.



Ron Henderson VK1RH, newly elected Federal President of the WIA, presenting a G A Taylor medal to the retiring President, Peter Gamble VK3YRP at the 1992 Federal Convention.

RIB 70

Paragraph 31 of RIB 70, which related to cross linking of repeaters, has been omitted from the reprint of that brochure. Unfortunately, however, some minor errors crept in to the reprint, and Sheila Grant from the DoTC Licensing Section Publications Sub-section has asked me to publicise the following so that you can correct your latest copy of RIB 70.

- The index still shows paragraph 31.
- Radiation Angle was omitted from Appendix E, paragraph 11.1 (d) and should be included as (vii).
- The code for the Morse Code commencing signal appearing in Appendix F should be corrected to show dahdidahdidah.

Sheila advises that an insert correcting these errors will be produced and inserted in the January 1992 edition of brochure RIB 70.

RIB 72

Part 3, the CALL AND REPLY section of RIB 72, has been out of touch with amateur radio reality for many years, and has been quite misleading to new amateurs wishing to learn the correct calling procedures.

In conjunction with the WIA this section has been completely rewritten to reflect current and proper practice. The latest reprint, showing the "Revised Jan '92" note on the bottom right hand corner of the front cover, includes the new Part 3 paragraphs. This is yet another example of the WIA, representing the Australian radio amateur service, working in co-operation with the DoTC to improve the conditions and privileges for all Australian amateurs.

Amateur or Ham

Since 1959 the WIA has had a policy to actively discourage the use of the word "ham" to describe an amateur radio operator. After taking into consideration:

1. the increased use, public understanding and acceptance of the expression "ham" to denote a radio amateur within Australia, without any derogatory intent;
2. the meanings of "ham" and "amateur" in the Australian Macquarie dictionary; and
3. the need to explain amateur radio in terms easily understood by the public and so raise their awareness of our hobby;

the WIA Federal Council has repealed that policy.

This does not mean that the WIA is actively advocating the use of the word "ham", simply saying that it is OK if people use it when describing an amateur radio operator.

Telephone RFI

As many amateurs have discovered to their dismay, the new slim-line push button telephones being marketed by AOTC (formerly Telecom), are very susceptible to RFI.

Barry Wilton from the WIA VK3 Division has been actively involved for some time in trying to find a solution to this problem, and at last Barry's endeavours have paid off.

In a letter just received, AOTC advise that they now have an EMI resistant TF200 telephone available which they believe will be adequate to solve most RFI problems encountered. Unfortunately, only limited stocks are available at present of these EMI resistant telephones.

According to the new AOTC policy, where a rental telephone is suffering from RFI, the customer shall have the option of having the telephone replaced with a special Telecom TF200 telephone which is resistant to the effects of EMI (at an increased annual rental "to cover the increased complexity and higher maintenance liability of this telephone").

Or, if a Telecom sale telephone has EMI problems within 12 months of purchase, a refund will be available.

This is another example of the WIA, representing the Australian radio amateur service, acting to improve conditions for all Australian amateurs.

Bill Roper VK3ARZ ar

Report to the WIA on WARC-92

David Wardlaw VK3ADW
Ron Henderson VK1RH

World Administrative Radio Conference 1992 or WARC-92 for short, was held in Torremolinos, Spain from 3 February to 4 March 1992. Some 1400 delegates from 120 countries met to discuss many vital radio-communications matters which will affect the world over the next few decades. The WARC was called by the International Telecommunications Union (ITU), an agency of the United Nations. The ITU regularly calls conferences concerned with the Radio Regulations. These are called Administrative Radio Conferences and their Final Acts have the status of an international treaty. In the case of WARC-92 the agenda included, amongst other things, possible changes to frequency allocations in certain parts of the spectrum. Consequently it was of interest to the amateur service.

Preparation

The Administrative Council of the ITU under instructions from the Plenipotentiary Conference, the supreme body of the ITU, published the WARC-92 agenda back in June 1990. Since then the Australian authorities, DOTC, through its Australian Preparatory Group or APG of some 90 members from the Department, government and industry had been active preparing the Australian position. The APG was assisted by its five committees of specialists which met approximately monthly. The WIA was represented on four of these, the technical, frequency allocation, regulatory and HF broadcasting committees by David Wardlaw VK3ADW and Ron Henderson VK1RH.

WARC-92 was tasked to consider "frequency allocations in certain parts of the spectrum"; in that way it differed from WARC-79 which was a general WARC of considerably longer duration and broader agenda. The agenda set for WARC-92 did not specifically mention amateur radio, however early in the preparation stages the International Amateur Radio Union (IARU) and member societies, of which the WIA is one, became aware amateur related issues might arise. These included pressures for additional HF broadcasting spectrum which could have affected the 40 metre band; demands for spectrum around 1.5, 2.5-3.0 GHz and the likelihood of wind profiler radars around 50, 400 and 1000 MHz.

Australia was represented at WARC-92 by a delegation 22 strong; made up of 5 DOTC officers, including the delegation leader and deputy, representatives from other government departments, CSIRO, the telecommunications, broadcasting and television industry and the WIA.

Amateurs at WARC-92

The IARU, being an "exempt international organisation", had an observer team at the WARC, led by its President Dick Baldwin W1RU. Other members of the team were Larry Price W4RA, IARU Secretary, David Sumner K1ZZ and Dan Bergeron KB4IYK, both IARU Secretariat, Wojciech Nietykaza SP5FM, IARU Region I Vice President, John Allaway G3FKM, IARU Region I Secretary, Al Shaio HK3DEU, IARU Region II President, Tom Atkins VE3CDM, IARU Region II Secretary and David Rankin 9V1RH, IARU Region III chairman.

Holding accredited observer status, and not associated with any national delegation, the IARU team were able to move about the conference and speak with delegations with a single authoritative amateur viewpoint.

In addition to the official IARU observer team there were amateur national society members on a number of delegations representing principally the amateur viewpoint. They were David Wardlaw VK3ADW and Ron Henderson VK1RH of the WIA with the Australian delegation, Ben Samsu YB0EBS of ORARI with Indonesia, Young Soon Park HL1IFM and Lee Young Ho HL1AKF of KARL with Korea, D D Deven 9M2DD of MARTS with Malaysia, Shoso Hara JA1AN and Masa Fujioka JM1UXU of JARL with Japan, Fred Johnson ZL2AMJ of NZART with New Zealand, David Evans G3OUF of RSGB with the UK, Paul Rinaldo W4RI of ARRL with USA, Mirko Mandrino YT7MM of SRJ with Yugoslavia, Marino Miceli I4SN of ARI with Italy, Ojekunie Ajayi 5N0OBA of NARS with Nigeria and Peter Hall SM0FSK and Sigge Skarsfjall SM5KUX of SSA with Sweden.

During the WARC the IARU placed a registration sheet in the conference foyer for all amateurs present to record their names and callsigns. By the end of the conference some 100 other licensed radio amateurs signified their attendance, showing around a 10 % amateur presence and giving rise to the jocular expression "amateur mafia!".

At this point it is worth noting all Australian members had full delegation member status, an action the DOTC is to be congratulated for implementing. Often this meant amateur members (and others) had to attend meetings and speak on behalf of Australia on matters not in their direct interest.

Conference Conduct

ITU decision making is achieved through a ponderous and lengthy process. The agenda is usually so large and wide ranging that it must be broken into manageable "chunks" or related issues and processed in numerous committees and working groups, meeting in parallel. Hence the value of a large delegation with all members briefed on a wide range of issues.

WARC-92 was no exception, for it set up six committees from day 2 and they in turn set up their own working groups, ad-hoc groups and drafting groups to grapple with the agenda items.

The two committees of principal interest to the amateur service were Committee 4- Frequency Allocations and Committee 5 - Regulatory Matters. Your two amateur representatives split their efforts across these with David following the frequency allocations and Ron the regulatory issues.

Also of interest was the Working Group of the Plenary which was the name given to the Technical Committee. This Committee dealt with Wind Profiler radars and was also covered by David.

All completed committee output documents were passed through an Editorial Committee to achieve consistency of ITU style and the requisite translation into the three working languages of the Union, namely French (the authoritative language), English and Spanish. The Editorial Committee then sponsored these output documents through two readings of Plenary to become final acts of the WARC.

In order to cover all the frequency allocation issues three committee 4 Working Groups were created, 4A for HF and proposals up to 137MHz, 4B for 137MHz to 3GHz and 4C for matters above 3GHz. Committee 5 also set up three Working Groups, however the division of its work was not as clear cut as for Committee 4.

The greater part of the first three weeks of the WARC was devoted to sub-committee meetings to hear national proposals, identify common ground and points of contention, then to resolve those differences through consensus. Many small sub groups were set up to consider specific points and report back to sub-committees.

Most meetings were conducted in six languages with speakers being simultaneously interpreted into the other five languages through wireless headsets. At the start it was eerie to enter a conference in session and hear only the rustle of papers until one collected a headset and switched on to the English channel! The languages were English, French, Spanish, Chinese, Russian and Arabic and the teams of interpreters were outstanding in their patience and workmanship.

Regular, though brief, meetings of Committees were held to review progress. This process was repeated with weekly Plenary meetings at which some nations felt the need to have their views recorded in the record despite the often somewhat redundant nature of their remarks.

By the end of the second week the committee chairmen could see the need for additional consideration time, for many nations were intent to speak at length on their national views. Indeed it felt at times the speech length was inversely proportional to the potential impact of the speaker's nation. Consequently, knowing the WARC could not be extended beyond its scheduled four weeks and two days, night and evening meeting sessions were programmed. Upon reflection, many nations were holding back and not prepared to disclose their true positions on the several conflicting frequency allocation issues. Consequently proposal papers continued to be printed and distributed until late into the conference and consensus through compromise was very late starting. Other contributing factors to this slow progress were the formation of blocks of interests; the CEPT was strong in professing consensus and compromise had already been reached in the Community and no member could back down further; the Arab and African states frequently supported each other whilst a lesser cohesion was seen from the Americas of Region I and no cohesion was apparent from South East Asia, due possibly to commercial and industrial influences from manufacturing nations in our region.

The last days of the WARC were hazy in many delegates' memories. On the last Sunday evening procedural points of order were raised with the Chairman, concerned with the slow progress being made in Plenary on frequency allocations around 1.5 and 2.5GHz. Eventually a point of order to adjourn for the day was moved and voted in favour. The Secretary General and WARC Chairman then met with concerned heads of delegations and eventually agreed a way ahead around 4 AM. The Plenary resumed at 9.30 AM and met in continuous session, except for meal breaks and whilst awaiting papers until all issues were resolved, some say by exhaustion, at 7.32 AM the final morning. Plenary reconvened at 2 PM for acceptance of formal statements for inclusion in the Final Acts, which were then printed and issued just before a 10.30 PM formal signing and closing session. In the event the Final Acts, as distributed, contain a gap in the frequency allocations from 960MHz to 13.75GHz, together with a secretarial note that the missing portion was being reconstructed from the notes of the Secretariat, the official precis and tape recordings and would be forwarded when completed. At the Australian WARC-92 debrief to the APG in Canberra in mid March '92 the head of Delegation said a copy of the outstanding material from the Final Acts was on its way to him from Geneva by special courier. They have now arrived.

The two WIA delegates to WARC '92 David Wardlaw VK3ADW and Ron Henderson VK1RH

Incidentally the collected papers from WARC-92, some 400 in all, are available from the ITU in electronic format on some 25 disks for around 200 Swiss francs.

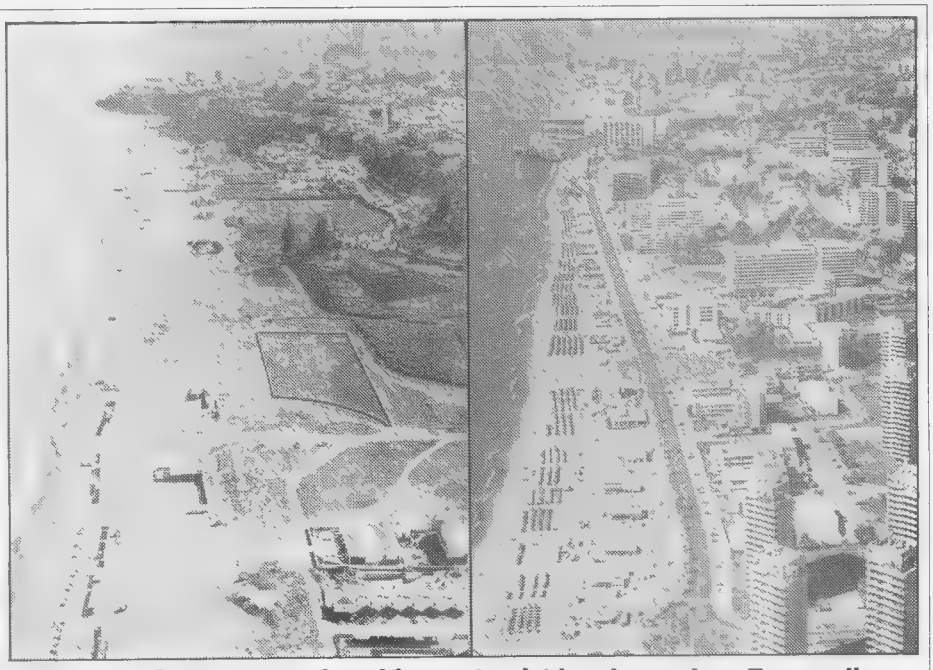
The Outcomes

In reviewing WARC-92 outcomes it's worthwhile going quickly through the whole agenda, highlighting issues which did, or may in the future affect the amateur and amateur satellite service. The amateur satellite service has received little mention throughout this report, however with the increasing emphasis being placed upon satellite communications there are potential implications for amateurs.

High Frequency Broadcasting

High frequency broadcasting(HFBC), despite strong pleas from broadcasting nations and equally strong resistance from principally emerging nations, gained some additional 790 kHz spread across the HF bands below 30MHz. This gain was not without concessions, for it will not be available before 2007, will need a further WARC to coordinate its introduction and must be used only for single sideband transmissions. The debate on re-allocation of spectrum to HFBC began at the higher frequency bands, where many nations felt they were able to re-allocate spectrum and worked down in frequency. By the time 10 MHz was reached opposition had stiffened considerably and the final plan, which was presented as a "take it or leave it, or all bets are off" package reallocated only 200 kHz below that point. Changes were made to broadcasting around 7MHz but many nations proposed no change to the amateur allocation. As a consequence any attempt to align the amateur band world wide was fraught with the danger that alignment might be by reducing the width of the band in Region II. Having stated the 200 kHz total reallocated to HFBC below 10MHz was an absolute limit the likelihood of reallocating a further 200 kHz at 7MHz for amateurs in Regions I and III was an impossible expectation. The IARU team discussed with nations sympathetic to amateurs a Recommendation the alignment of the 7MHz band be referred to a later WARC and this was accepted by the WARC and appears in the final Articles. In effect we survive to try again at a later date when the HFBC situation has stabilised and reduced the pressure for spectrum.

Another HF gain was a recommendation directing nations to maintain their HF broadcasting within the designated bands. This recommendation should be included in amateur intruder reports to reinforce their impact.



These two pictures, reproduced from a tourist brochure, show Torremolinos recently and as it was about 50 years ago. On the Spanish Costa del Sol (or Sunshine Coast) it seems rather reminiscent of how our own Queensland Gold Coast and Sunshine Coast have evolved.

Mobile Satellite Service

The Mobile Satellite Service (MSS) was a contender for spectrum around 150MHz and 1.5GHz. LEOs or Low Earth Orbit satellites were contenders for this spectrum, which amateur satellite users know is ideal for such applications. The Table of Frequency Allocations was altered around 137 and 150MHz and at selected frequency segments between 1 to 3GHz to accommodate them. The outcome for amateurs will be new neighbours at 148-149.9MHz which is to become a LEO uplink band.

Broadcasting Satellite Service Sound

The Broadcasting Satellite Service Sound (BSS(sound)) is intended to be based on digital broadcasting techniques, otherwise known as Digital Audio Broadcasting - DAB. The service has a complementary terrestrial broadcasting service using the same techniques. The WARC had difficulty in allocating one unique frequency band worldwide, despite its attraction for equipment manufacturers and in the end established three distinct bands, namely;

1452-1492MHz world wide with secondary status in many countries until 2007;

2310-2360MHz in the USA, which is also secondary to the Amateur Service; and,

2535-2655MHz in some Region III countries and Russia.

Amateurs may be able to take advantage of DAB techniques in the future and combine voice and data on the same channels for DAB multiplexes many channels on the one bearer.

Future Public Land Mobile Telecommunications Service

Future Public Land Mobile Telecommunications Service (FPLMTS) is a system for the future where a user with a low power hand held cellular phone can roam world wide with immediate communications. It poses questions of sovereign rights of nations, the recovery of call costs and the interconnections between its terrestrial and satellite components. The WARC was of the opinion it needed further study by the CCIR but they did allocate, through a footnote, spectrum in the bands 1885-2025 and 2110-2200MHz on a world wide basis. Whilst these frequencies are not near any amateur allocations the technology has much amateur potential if employed in our bands.

High Definition Television

High Definition Television (HDTV) is a high technology extension of television

services which employ satellites and provide a significantly higher grade of picture. It is a direct satellite to user broadcast service and desirably should have a common frequency allocation world wide. WARC however was only able to agree on an allocation to Region II in the range 17.3-17.8GHz and in Regions I and III 21.4-22GHz, commencing in the year 2007. The amateur implications are slight unless we also wish to go into high definition ATV satellites utilising commercial HDTV receivers with down converters.

Aeronautical Public Services

WARC had before it consideration of frequency allocations for the Aeronautical Public Service (APS) which will permit phone calls from passenger aircraft in flight to the public telephone systems of the world. Once again a world wide frequency allocation was highly desirable and the WARC agreed an allocation at 1670-1675MHz ground to air , and 1800-1805MHz air to ground. A footnote was entered by some Region II countries, including USA and Canada, for allocations around 850 and 890MHz. Consequently aircraft will probably need to be equipped with two transceivers to permit world wide usage.

Wind Profilers

Wind profilers are doppler radars which determine the wind profiles at a number of altitudes. Several well separated frequencies are required to cover all heights of interest and the CCIR is already studying frequencies around 50, 400 and 1000MHz, somewhat close to amateur allocations for comfort. Indeed experimental systems have been operating at 49MHz in Darwin and the USA showed a preference for 449MHz, a selection which did not receive much support at the conference although it did avoid safety of life satellite communications around 406MHz. The WARC discussed the matter at some length and resolved to refer the matter to the CCIR for further studies before allocating frequency segments.

The 75.5-81GHz band

Amateurs have a little used allocation in the Table of Frequency Allocations at 75.5-81MHz. 75.5-76GHz is primary amateur whilst the remainder of the band is secondary. A Russian Federation initiative for Space Research (Earth to Space) now makes that service an additional secondary service in the band. The views of experts in the field suggest the Russians will not be able to take up this allocation for some time.

Footnotes

One observation from WARC-92 was the increase in use of footnotes to designate a differing use for a frequency band from the usage shown in the Table of Allocations. This happened despite the fact that the ITU has set up a Volunteer Group of Experts (VGE) to simplify the Radio Regulations, of which the Table of Frequency Allocations is RR 8. One of particular note was the increased use of 430-440MHz by other than the Amateur Service in some 64 nations.

Regulatory Matters

On the regulatory side the Radio Regulations relating to qualifications for ships operators were revised to align them with the Safety Of Life At Sea (SOLAS) Convention. This means ships will be changing over to Global Maritime Distress and Safety System (GMDSS), a satellite based reporting system in the near future replacing the redundancy of ship borne equipment and the technically qualified maintainer-operator. The International Maritime Organisation (IMO) believes when GMDSS is fully implemented in 1999 use of morse radiotelegraphy by ships will cease after 100 years of dedicated and faithful service. The implications for the Amateur Service are we will then be the sole remaining service requiring morse proficiency for an operator's certificate and no doubt the regulatory authorities will question its relevancy.

The future of WARCs

During WARC-92 an evening was devoted to reporting and discussion by the High Level Committee (HLC), a group of people expert in ITU ways, who were tasked in 1990 to review ITU operations. The HLC proposed a number of significant changes to make the ITU more efficient whilst still remaining within its budget. One proposal, which the Secretary General has already adopted, was to schedule WARCs at more frequent intervals, but for lesser duration and with shorter agenda devoted to like issues. We are therefore likely to see WARCs every two years, with around four years notice of their agenda. This will probably cause the Australian Preparatory Group(APG) to remain continuously in session, possibly meeting half yearly, with the specific WARC preparation done by dedicated committees. The WIA will need to monitor all APG meetings and seek representation on those WARC committees which have agenda items which might affect the Amateur Service. For planning purposes we should think about having to be represented at around half these shorter WARCS, that is for fourteen to sixteen days every four years.

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New Date for Deferred NSW Division AGM

Sunday 28th June 1992
See VK2 notes page 47

Have you advised DoTC of your new address?

Deregulation of Licence Conditions

For many months the WIA and the DoTC have been working together to bring about a new set of deregulated amateur licence conditions. The release of the draft of the licence conditions for public comment represents a major breakthrough in the move towards deregulation and increased self management by the Amateur Service in Australia. But what do the changes mean to the amateur community?

Bill Roper VK3ARZ

Amongst other things, the new licence conditions no longer distinguish between the different modes of operation. Licence conditions are now expressed in general terms which apply to all modes of operation.

A new class of licence, based on Novice theory and no CW examination, the Novice Limited, is included in the conditions. These licensees will be permitted the use of 30 watts mean power; FM only, on the 146 - 148 MHz Novice band.

Power limitations for Novice and Novice Limited operators have been increased to more readily align with commonly available commercial equipment - 100 watts output on SSB, and 30 watts on FM. Combined Limited and Novice licence holders will be able to use full 400 watts power on all bands, not just those above 30 MHz.

Identification requirements have been simplified considerably. For instance, all amateur stations will now be required to transmit *their own callsign only* at the beginning and end of each series of transmissions, and at ten minute intervals.

These changes will be most noticed by packet operators. The new identification requirements will allow packet networks to be more easily established using software which is readily available overseas and which to date has been illegal to use in Australia under the current identification requirements. Also, some repeater stations will no longer have to identify.

Probably the greatest area of change in the licence conditions is in the area of repeaters. For some time now the amateur community has been moving to establish networks of repeaters, a task that was proving difficult under the current conditions. The new conditions recognise the concept of a network of repeaters as an entity in its own right. Traffic between repeater network stations is seen as traffic that belongs to the network, not to the originator of the signal. This simplifies the process when, for instance, a Novice is being retransmitted on linked repeaters.

Gone also are the current restrictions on linking of repeaters. The scope and functionality of a repeater network is only limited by the imagination of the designers of the repeater. We could now establish a network of repeaters that you access on voice and have your signal emerge to the party you are calling as a packet message and vice versa.

The new conditions are a major advance for the amateur service in Australia and remove many unwanted regulations. However, conditions in respect of matters such as interference are virtually unchanged. A responsible attitude on the part of ALL amateurs is necessary if the new conditions are to be a success.

Although these proposed licence conditions represent a giant step along the road of deregulation, the WIA will continue to seek further privileges for Australian radio amateurs.

To help us in that regard further input from members would be most welcome.

If you have any comments on the proposed changes to licence conditions, as published below, please forward them in writing to Mr. D. Hunt, Director Licensing, PO Box 594, GPO Canberra ACT 2601, to reach him no later than 17th July 1992. Please also forward a copy of your comments to DoTC to the WIA at PO Box 300 Caulfield South VIC 3162.

The DoTC news release follows:

PROPOSED LICENCE AND TECHNICAL CONDITIONS TO BE ATTACHED TO AMATEUR STATION LICENCES

PART 1 – GENERAL

The Amateur Service in Australia is authorised under the *Radiocommunications Act 1983*, the Radiocommunications Certificate of Proficiency Regulations and the Radiocommunications (Licensing and General) Regulations.

All licensees are required by law to abide by the licence conditions for the Amateur Service specified in this attachment.

An applicant for a licence must have achieved a satisfactory result in an Amateur Operators Examination in accordance with the Radiocommunications (Certificate of Proficiency) Regulations before an Amateur station licence can be issued.

The following are the licence conditions for Australian Amateur Stations including Beacon, Repeater, and Translator stations. This attachment incorporates conditions prescribed in the International Telecommunications Regulations, *Radiocommunications Act 1983*, and the Radiocommunications (Licensing and General) Regulations.

PART 2 - LICENCE CONDITIONS

Licence

1. One licence is required for each Amateur Station.

Change of Address

2. Permanent change of address must be

notified in writing, within two weeks, to any Departmental office in your State or Territory.

Use of Amateur Stations

3. The Licensee of an amateur station must use the station solely for the purposes of self training, intercommunications of a personal nature and investigation into radiocommunications. Activities considered not to be included in communications of this nature would be the use of the station for:

(a) financial gain;

(b) transmission of any form of entertainment including:

(i) music - (except music incidental to training videos and tapes);

(ii) aural or visual amusement;

(iii)video or radio broadcast programs; or

(iv) advertisement material.

(c) transmission of material relating to industrial, commercial, political, or religious matters; and

(d) re transmission of another amateur station's transmissions without that station's consent.

Communications by Amateur Stations

4. The licensee of an amateur station must abide by the provisions set out in Article 32 of the International Radio Regulations (refer Appendix B).

Third Party Traffic

5. Subject to the provisions set out in the International Radio Regulations, Third Party Traffic is permitted.

Note. Australia has Third Party Traffic agreements with Canada, Honduras, Israel, Solomon Islands and the United States of America.

6. Except in the event of a natural disaster or as authorised by the Minister, the licensee of an amateur station must not solicit for Third Party Traffic.

Display of Station Licence

7. The amateur station licence and/or the operators Certificate of Proficiency must be made available on the request of an authorised officer of the Department of Transport and Communications.

Control of Station

8. The licensee of an amateur station must have direct control of all operations of the station at all times (unattended repeater and beacon stations excepted).

9. The licensee of an amateur station must ensure adequate security measures are taken to prevent operation of the station by unauthorised persons.

10. A qualified operator, if permitting an unqualified person to transmit from the station, shall be responsible for the supervision and control of all operations of the station, including station identification in the prescribed manner at the beginning and end of each series of transmissions.

11. The licensee, if permitting another qualified operator to operate the station in his/her absence, must do so in writing.

Unattended Stations

12. The licensee of an amateur station, if operating the station unattended, must ensure that:

(a) the transmitter is fitted with a device to cause automatic shut-down in the event of a fault causing unintentional continuous transmission for a period exceeding 10 minutes duration; and

(b) prompt termination of transmissions is able to be effected in the event that interference is caused to other services.

Identification of Stations

13. The licensee of an amateur station must not, except for brief tests and adjustments, cause a transmission to be emitted from the station transmitter(s) on any frequency unless identified.

14. The licensee of an amateur station must transmit his/her own callsign at the beginning and end of each series of transmissions and at least every 10 minutes during a series of transmissions. Fixed frequency, fixed location amateur repeater stations do not have to identify.

15. The call sign must be transmitted either by voice, visual image or an internationally recognised code.

Interference

16. The licensee of an amateur station must take such measures as are reasonably practicable to erect, fix, place and use the transmitter(s) in such a manner as to avoid interference to the efficient and convenient working of other stations.

17. The licensee of an amateur station must comply with any written directions given by an authorised officer of the Department of Transport and Communications in relation to:

(a) the installation and maintenance of a station or service; and

(b) any accessory apparatus used, or to be used, in the operation of the station or service

as are reasonably necessary for the operation of that station or service so as to avoid interference to radiocommunications.

Club Stations

18. Club stations may be operated only in the presence of a qualified operator and in accordance with the qualifications of the operator supervising all operations. A log book recording all use of the station must be kept with identification of the operator supervising the transmissions clearly indicated.

19. A club station must not be operated at other than the address shown on the licence without prior notification to the Department of Transport and Communications.

Frequencies

20. The licensee of an amateur station must only transmit:

(a) on frequencies within the band limits, specified in Appendix D, under the column heading of the class of station licence; and

(b) in accordance with the footnotes to Appendix D.

Emissions

Note. Explanations of Emission designations appear in Appendix F.

21. The licensee of an amateur station (Novice Limited) must only use emission mode 16K0F3E.

22. The licensee of an amateur station (Novice) must only use the following emission modes:

(a) when operating on bands below 30 MHz: 200HA1A, 8K00A3E, 4K00H3E, 4K00R3E, 8K00B8E/B8W and 4K00J3E.

(b) when operating in the 146-148 MHz band: 16K0F3E.

23. When operating on bands below 30 MHz, the licensee of an amateur station (Combined Limited and Novice) must only use the following emission modes: 200HA1A, 8K00A3E, 4K00H3E, 4K00R3E, 8K00B8E/B8W and 4K00J3E

24. When operating on bands below 30 MHz, the licensee of an amateur station (Unrestricted) must only use the following emission modes:

200HA1A/A1B, 6K00A2A/A2B/A2D, 8K00A3E, 4K00A3EKN*, 4K00R3E, 2K00R3EKN*, 4K00J3E, 2K00J3EKN*, 4K00H3E, 2K00H3EKN*, 8K00B8E/B8W, 6K00A3C, 3K00R3C/J3C/H3C, 6K00A3F, 3K00J3F, 1K12F1A/F1B/F1D, 6K00F3E/G3E, 16K0F3E**, 6K00F2B/G2B/G2D/F2A/G2A/F2D, 6K00F3C/G3C, 6K00F3F/G3F.

Note 1. Use of the emission modes designated with '*' is limited to Narrow Band Voice Modulation (NBVM).

Note 2. Use of the emission mode designated with '**' is limited to the bands above 28 MHz.

Note 3. The bandwidths shown in the above emissions are the maximum permitted values. Amateur stations may use lesser bandwidths if so desired.

25. The licensee of an amateur station (Lim-

ited), an amateur station (Combined Limited and Novice), or an amateur station (Unrestricted), operating on bands above 50 MHz may employ any emission mode but must ensure that:

(a) wideband television, spread spectrum or pulse emission modes are used only on bands above 420 MHz; and

(b) the emission mode in use does not:

(i) cause interference to primary/secondary radiocommunications services utilising the same band(s); or

(ii) inhibit other amateur stations from using the band(s).

Power

26. The licensee of an:

(a) amateur station (Unrestricted);

(b) amateur station (Limited); or

(c) amateur station (Combined Limited and Novice)

must ensure that the station's output power does not exceed that indicated in column 2 in the same row for the type of emission(s) detailed in column 1 of Table 1.

Table 1

Column 1	Column 2
Single Sideband Voice (J2E, R3E) Vestigial/Sideband Television	400 watts pX
All other emission modes	120 watts pY

Note. Refer to Appendix D for approved frequency bands.

27. The licensee of an amateur station (Novice) must ensure that the station's output power does not exceed that indicated in column 2 in the same row for the type of emission(s) detailed in column 1 of Table 2.

Table 2

Column 1	Column 2
Single Sideband Voice (J3E, R3E)	100 watts pX
All other emission modes	30 watts pY

Note. Refer to Appendix D for approved frequency bands

28. The licensee of an amateur station (Novice Limited) must ensure that the station's output power does not exceed 30 watts pY.

Beacon Stations

29. Amateur beacon stations shall conform to the general provisions outlined in these licence conditions.

Repeater/Translator Stations

30. Amateur repeater and translator stations shall conform to the general provisions outlined in these licence conditions.

31. Repeater and translator station's may be linked to form a network(s) of repeaters or translators.

Note.

Where a tone access system is used to control the linking of repeater or translator stations, the parameters for these tone access methods are set out in Appendix E

APPENDIX A

TERMS AND DEFINITIONS

For the purposes of these licence conditions the following terms and definitions apply.

Amateur Service

A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Amateur Satellite Service

A *radiocommunication service* using *space stations* on *earth satellites* for the same purpose as those of the *amateur* service.

Amateur Station

means a station -

(a) that employs, for radiocommunication, any frequency included in the frequencies designated in the frequency table as a frequency for use by an *amateur* service; and

(b) that is used without financial gain and solely for the purpose of self training, intercommunication and investigations into radiocommunications.

Authorised Officer

means an officer of the Department of Transport and Communications who has been authorised by the Minister for the purposes of that provision.

Club Station

means a station in the *amateur* service for which a licence is held by a group of persons such as a school, college, institute, radio club or similar.

'pX' (Peak Envelope Power - Watts)

means the average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions.

'pY' (Mean Power - Watts)

means the average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

Qualified Operator

means a person holding a certificate of proficiency issued in accordance with the provisions of the *Radiocommunications Act 1983.*

Repeater/Translator Station

includes a station in the *amateur* service used for the automatic reception and re transmission of signals.

Repeater Network

includes a system of two or more *amateur* repeater stations linked together for the automatic reception and re transmission of signals. Traffic within the network is traffic of the network, not the stations accessing the network and, except in the case of portable/mobile repeater stations, does not need to be separately identified.

Third Party Traffic

in relation to the communications between *amateur* stations means messages passed on behalf of any other person who is not a qualified *amateur* operator. Subject to the laws of another country, *amateur* to *amateur* communications are not considered to be Third Party Traffic.

APPENDIX B

ARTICLE 32 - INTERNATIONAL REGULATIONS

Section I

Amateur Service

1. Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications.

2. (1) When transmissions between amateur stations of different countries are permitted, they shall be made in plain language and shall be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified.

(2) It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.

(3) The preceding provisions may be modified by special arrangements between administrations of the countries concerned.

3. (1) Any person seeking a licence to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear, texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz.

(2) Administrations shall take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate the apparatus of an amateur station.

4. The maximum power of amateur stations shall be fixed by the administrations concerned, having regard to the technical qualifications of the operators and to the conditions under which these stations are to operate.

5. (1) All the general rules of the Convention and of these regulations shall apply to amateur stations. In particular, the emitted frequency shall be as stable and as free from spurious emissions as the state of technical development for such stations permits.

(2) During the course of their transmissions, amateur stations shall transmit their call sign at short intervals.

Section II

Amateur-Satellite Service

6. The provisions of section I of this Article shall apply equally, as appropriate, to the amateur-satellite service.

7. Space stations in the amateur-satellite service operating in bands shared with other services shall be fitted with appropriate devices for controlling emissions in the event that harmful interference is reported in accordance with the procedure laid down in Article 22. Administrations authorising such space stations shall inform the IFRB and shall ensure that sufficient earth command stations are established before launch to guarantee that any harmful interference which might be reported can be terminated by the authorising administration.

APPENDIX C

EXTRACT FROM THE *RADIOCOMMUNICATIONS ACT 1983*

Conditions to which transmitter licence is subject.

25 (1) A licence to operate and possess a radiocommunications transmitter is subject to the following conditions:

(a) a condition that the holder of the licence shall not operate, or permit the operation of, the transmitter except for a purpose specified in the licence, being a purpose not inconsistent with a purpose of a kind specified in the appropriate frequency band plan under sub-section 19(2);

(b) a condition that the holder of the licence shall not operate, or permit the operation of, the transmitter except in accordance with provisions specified in the licence, being provisions relating to-

(i) the prevention or reduction of interference, or of the likelihood of interference, to radiocommunications;

(ii) the prevention or reduction of risk of death of, or injury to, persons, or risk of loss of, or

damage to, property; or

(iii) the transmission of an identification signal;

(c) a condition that the holder of the licence shall not operate, or permit the operation of, the transmitter except on a frequency or frequencies or on a frequency channel, and at a constancy, specified in the licence;

(d) a condition that the holder of the licence shall not operate, or permit the operation of, the transmitter in such a manner as would be likely to cause reasonable persons, justifiably in all the circumstances, to be seriously alarmed or seriously affronted, or for the purposes of harassing a person;

(e) a condition that the holder of the licence shall not operate the transmitter unless he is a qualified operator in relation to the licence;

(f) a condition that the holder of the licence shall comply with sub-section 269A(2) of the *Navigation Act 1912*;

NOTE: 269A(2) A person in charge of a radiocommunications transmitter that is within the jurisdiction of the Commonwealth (including a transmitter in a Territory) or that is operated by virtue of a transmitter licence or a temporary permit granted under the *Radiocommunications Act 1983*, shall on receiving the prescribed safety signal, refrain from sending messages for a time sufficient to allow other stations to receive the message, and, if so required by the Minister, shall transmit the information in the manner directed by him.

(g) a condition that the holder of the licence shall comply with any direction with respect to the operation of the transmitter given to him, in a manner not inconsistent with any relevant guidelines in force under sub-section (4), either orally or in writing, by-

(i) a member of the Australian Federal Police;

(ii) a member of the police force of a State or Territory;

(iii) an officer of the Defence Force;

(iv) an officer of the Australian Coastal Surveillance Centre; or

(v) an officer included in a prescribed class of officers, being an officer of a prescribed organisation the sole or principal purpose of which is to deal with natural disasters, that is reasonably necessary for the purpose of-

(vi) securing the safety of a vessel of aircraft that is in danger;

(vii) dealing with an emergency involving a serious threat to the environment; or

(viii) dealing with an emergency involving risk of death of, or injury to, persons or risk of substantial loss of, or substantial damage to, property;

(h) a condition that the holder of the licence shall comply with the provisions of this Act;

(j) such conditions (if any) as are prescribed;

(k) such other conditions (if any) as are specified in the licence.

Contravening conditions of transmitter licences

27. A person who, without a reasonable excuse, contravenes a condition of a transmitter licence is guilty of an offence punishable on conviction by a fine not exceeding $1,000.

Repeaters - additions, deletions, alterations. Have you advised the WIA of changes needed to the repeater list?

APPENDIX D

Amateur Station (Unrestricted)

Frequency	Notes
1.800 - 1.825 MHz	
1.825 - 1.875 MHz	(A) (B)
3.500 - 3.700 MHz	
3.794 - 3.800 MHz	(A) (C)
7.000 - 7.100 MHz	(G)
7.100 - 7.300 MHz	(A)
10.100 - 10.150 MHz	(A) (D)
14.000 - 14.250 MHz	(G)
14.250 - 14.350 MHz	
18.068 - 18.168 MHz	(G)
21.000 - 21.450 MHz	(G)
24.890 - 24.990 MHz	(G)
28.000 - 29.700 MHz	(G)
50 - 52 MHz	(A) (F)
52 - 54 MHz	
144 - 146 MHz	(G)
146 - 148 MHz	
5.670 - 5.725 GHz	(A)
5.725 - 5.830 GHz	(A) (E)
5.830 - 5.850 GHz	(A) (E) (G)
10.00 - 10.45 GHz	(A)
10.45 - 10.50 GHz	(A) (G)
24.00 - 24.05 GHz	(E) (G)
24.05 - 24.25 GHz	(A) (E)
47.00 - 47.20 GHz	(G)
75.50 - 76.00 GHz	(G)
76.00 - 81.00 GHz	(A) (G)
119.98 - 120.02 GHz	(A)
142.00 - 144.00 GHz	(G)
144.00 - 149.00 GHz	(A) (G)
241.00 - 248.00 GHz	(A) (E) (G)
248.00 - 250.00 GHz	(G)

Amateur Station (Limited)

Frequency	Notes
50 - 52 MHz	(A) (F)
52 - 54 MHz	
144 - 146 MHz	(G)
146 - 148 MHz	
420 - 435 MHz	(A)
435 - 438 MHz	(A) (G)
438 - 450 MHz	(A)
1240 - 1260 MHz	(A)
1260 - 1270 MHz	(A) (G)
1270 - 1300 MHz	(A)
2300 - 2400 MHz	(A)
2400 - 2450 MHz	(A) (E)(G)
3.300 - 3.400 GHz	(A)
3.400 - 3.410 GHz	(A) (G)
3.410 - 3.600 GHz	(A)
5.650 - 5.670 GHz	(A) (G)
5.670 - 5.725 GHz	(A)
5.670 - 5.725 GHz	(A)
5.670 - 5.725 GHz	(A)
5.725 - 5.830 GHz	(A) (E)
5.830 - 5.850 GHz	(A) (E)(G)
10.0 - 10.45 GHz	(A)
10.45 - 10.50 GHz	(A) (G)
24.00 - 24.05 GHz	(E) (G)
24.05 - 24.25 GHz	(A) (E)
47.00 - 47.20 GHz	(G)
75.50 - 76.00 GHz	(G)
76.00 - 81.0 GHz	(A) (G)
119.98 - 120.02 GHz	(A)
142.00- 144.00 GHz	(G)
144.00 - 149.00 GHz	(A) (G)
241.00 - 248.00 GHz	(A) (E) (G)
248.00 - 250.00 GHz	(G)

Amateur Station (Novice)

Frequency	Notes
3.525 - 3.625 MHz	
21.125 - 21.200 MHz	(G)
28.100 - 28.600 MHz	(G)
146.000 - 148.000 MHz	

Amateur Station (Combined Limited and Novice)

Frequency	Notes
3.525 - 3.625 MHz	
21.125 - 21.200 MHz	(G)
28.100 - 28.600 MHz	(G)
50 - 52 MHz	(A) (F)
52 - 54 MHz	
144 - 146 MHz	(G)
146 - 148 MHz	
420 - 435 MHz	(A)
435 - 438 MHz	(A) (G)
438 - 450 MHz	(A)
1240 - 1260 MHz	(A)
1260 - 1270 MHz	(A) (G)
1270 - 1300 MHz	(A)
2300 - 2400 MHz	(A)
2400 - 2450 MHz	(A) (E) (G)
3.300 - 3.400 GHz	(A)
3.400 - 3.410 GHz	(A) (G)
3.410 - 3.600 GHz	(A)
5.650 - 5.670 GHz	(A) (G)
5.670 - 5.725 GHz	(A)
5.725 - 5.830 GHz	(A) (E)
5.830 - 5.850 GHz	(A) (E) (G)
10.0 - 10.45 GHz	(A)
10.45 - 10.50 GHz	(A) (G)
24.00 - 24.05 GHz	(E) (G)
24.05 - 24.25 GHz	(A) (E)
47.00 - 47.20 GHz	(G)
75.50 - 76.00 GHz	(G)
76.00 - 81.0 GHz	(A) (G)

Frequency	Notes
119.98 - 120.02 GHz	(A)
142.00- 144.00 GHz	(G)
144.00 - 149.00 GHz	(A) (G)
241.00 - 248.00 GHz	(A) (E) (G)
248.00 - 250.00 GHz	(G)

Amateur Station (Novice Limited)

Frequency

146 - 148 MHz

FOOTNOTES

A The Amateur Service is allocated on a secondary (non-interference) basis in this band.

B Amateur licensees shall avoid operation within +/- 4 kHz of 1.870 MHz.

C Amateur licensees shall avoid operation within + 1 kHz of 3.794 MHz.

D Amateur licensees shall avoid operation within +/- 4 kHz of 10.1415 MHz.

E Amateur licensees using this band must accept any harmful interference that may be experienced from Industrial, Scientific or Medical (ISM) equipment operating in this band.

F Amateur stations are permitted to operate within this band subject to the following conditions:

(i) No interference is caused to the reception of channel 0 transmissions;

(ii) In New South Wales, Victoria, Queensland and Tasmania, operation is restricted to:

(a) the sub-band 50.05 to 50.20 MHz;

(b) locations outside the following minimum radial distances from;

(i) Television Channel 0 main stations - 120 kms;(ii) Television

Channel 0 translator stations - 60 kms;(iii) Television Channel 0 translator stations with Channel 0 inputs - 60 kms

(c) emission mode 200HA1A with a maximum transmitter power of 100 watts pY; and

(d) emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

(iii) In the Australian Capital Territory operation is restricted to:

(a) the sub-band 50.05 to 50.20 MHz;

(b) emission mode 200HA1A with a maximum transmitter power of 100 watts pY; and

(c) emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

G Communications with amateur satellites are authorised in this band. (Excluding Novice licensees).

APPENDIX E
TONE ACCESS CONTROL PARAMETERS

(i) Tone Burst tone frequency 1750 Hz.

(ii) CTCSS EIA standard tones (Hz)

67.0	94.8	141.3
69.0	100.0	146.2
71.9	103.5	151.2
74.4	107.2	156.7
77.0	110.9	162.2
79.0	114.8	167.9
82.5	118.8	173.8
85.4	123.0	179.9
88.5	131.8	186.2
91.5	136.5	192.8

(iii) DTMF Bell Standard

		Digit		
	697 Hz	1	2	3
Low	770 Hz	4	5	6
Tone	852 Hz	7	8	9
	942 Hz	*	0	#
High Tone		1209 Hz	1336 Hz	1477 Hz

APPENDIX F
ITU EMISSION DESIGNATIONS

Classification of Emissions

1. Classification of emissions provides an internationally recognised standard to accurately specify the significant characteristics of a transmission.
2. The abridged version of the emission designation system, detailed in paragraphs 3-6, covers emissions used in the Amateur service. More comprehensive details on emission classes may be found in the International Telecommunications Union (ITU) Radio Regulations.

Classification Method

3. To fully classify an emission a total of NINE letters and figures are used. The first FOUR provide details of the necessary bandwidth, the following THREE give details of the basic characteristics of the emission and the last TWO, which are optional, describe any additional characteristics which may provide a more complete description of the emission.

Example:

6M25 C3F MN

[6M25] Necessary Bandwidth

[C3F] Emission Characteristics

[MN] Supplementary information

First Four Symbols

4. These provide details of the necessary bandwidth of the emission expressed by three numerals and one letter. The letter occupies the position of the decimal point and may be H for Hertz, K for Kilohertz, M for Megahertz or G for Gigahertz.

Following Three Symbols

5. these describe the basic characteristics of the emission. The first defines the type of modulation of the main carrier, the second the nature of the signal(s) modulating the carrier and the third the type of information transmitted.

First Symbol - type of modulation of the main carrier

(a) Emission in which the main carrier amplitude is modulated:
(i) Double-sideband (Amplitude Modulated) A
(ii) Single-sideband, full carrier H
(iii) Single-sideband, reduced carrier R
(iv) Single-sideband, suppressed carrier J
(v) Independent sideband B
(vi) Vestigial sideband C

(b) Emissions in which the main carrier is angle modulated:
(i) Frequency Modulation F
(ii) Phase modulation G

(c) Emission pulses:
(i) Unmodulated sequence of pulses P

Second symbol - nature of signal(s) modulating the main carrier

(a) No modulating signal 0

(b) A single channel containing quantitized or digital information without the use of a modulating carrier 1

(c) A single channel containing quantitized or digital information with the use of a modulating carrier 2

(d) A single channel containing analogue information 3

(e) Two or more channels containing analogue information 8

Third Symbol - type of information transmitted

(a) No information transmitted N
(b) Telegraphy - for aural reception A
(c) Telegraphy - for automatic reception B
(d) Facsimile C
(e) Data transmission, telemetry, telecommand D
(f) Telephony E
(g) Television F
(h) Combination of the above W

Last Two Symbols

6. These describe any additional characteristics which provide a more complete description of the emission.

First Symbol - details of signal

(a) Sound of commercial quality with the use of frequency inversion or band splitting K
(b) MonochromeM
(c) Colour N

Second Symbol - nature of multiplexing

(a) None N

Emission Description

7. Examples:

200HA1A 200 Hertz bandwidth double-sideband single channel (without the use of a modulating audio frequency) TELEGRAPHY for aural reception

3K00J3E 3.00 Kilohertz bandwidth single-sideband suppressed carrier single channel analogue TELEPHONY

6K00A3E 6.00 Kilohertz bandwidth double-sideband single channel analogue TELEPHONY

16K0F3E 16.0 Kilohertz bandwidth frequency modulated single channel analogue TELEPHONY

ar

COVER STORY

James Brinkhoff VK7PAN

Don Cripps VK7AY
PO Box 414, DEVONPORT 7310

It is really great to know of our younger generation who are showing their hands by becoming amateur radio operators. Here is another, and I believe it is all the more interesting as this young man has no family with amateur radio interests, and I understand made his attack on the NAOCP without really knowing any amateur enthusiasts.

James Brinkhoff, aged 11 years, sat for his NAOCP exam, Morse theory and regulations on 20 November 1991, passed all sections, and was granted his licence on 10 December, callsign VK7PAN.

James comes from the small town of Kelso, on the Tamar River, site of transmitters for ABC station 7NT. (Maybe the sight of those high antenna masts was the catalyst!).

Within a day or so of receiving his licence, he was lent a transceiver, helped to erect a G5RV, and introduced himself to Tasmanian amateurs on the daily sked on 3590, known as the "sewing circle". (Thereby hangs another tale). He has been a regular contributor on the "sewing circle" ever since, and has also been regular on the "Tasmanian Devil Net" on Tuesday evenings; he has many overseas contacts to his credit already.

James turned 12 on 20 December.

He admits to first trying out CB radio, no doubt from his father's and mother's (Steven and Judy) interests in yachting, but says his enthusiasm stems from his long-time interest in electronics, so here's hoping this brings him fortune.

When asked how he enjoyed learning Morse code, he very nonchalantly replied, "Oh, that was easy; I could read it pretty well after a couple of nights study. **ar**

"Computarock" HF Receiver

An ingenious and relatively inexpensive "home-brew" answer to the need for a general-coverage HF receiver. "If a digital readout is desired, counting a VFO which tunes 8-9MHz can be done easily without need for further manipulation."

Drew Diamond VK3XU
Nar Meian, Gatters Rd,
WONGA PARK 3115.

A constructor wishing to build a workable multi-band HF receiver may search through magazines and handbooks, only to find "high-performance" designs which can look rather daunting, typically having lots of complex switched filters, ingenious PLLs, AGC loops, intricate metal-work and fancy hard-to-get components. In radio literature there appears to be a substantial gap between the fully engineered no-compromise designs and the relatively simple, no-frills single-band DC or superhet receivers. These simpler designs make interesting and worthwhile projects for radio enthusiasts of all types, and presently there is a wealth of material from which to choose. As a rule, however, they fall short of the standard necessary for a home station receiver, particularly where greater frequency coverage is required.

Here is a practical receiver which attempts to fill that gap. It is a consolidatation of circuitry from previous projects, notably the "Super-DC"[1], "Computarock"[2] and "DC91"[3] efforts, together with ideas from other experimenters. Whilst not intended for exact duplication, the circuit details presented here may encourage the more experienced worker to adapt and modify according to individual requirements and resources.

No claims of high-performance are made. The simplified and compromised nature of the input band pass filter may allow an unwanted image signal (it will need to be a strong one) to appear near a wanted signal and pass through to detection. NE602s are used as first and second mixer. Whilst by far not the strongest mixer IC available, they are cheap, easy to use, and obtainable. Finally, AGC is only applied to the 3-4MHz RF amplifier stage, so useful but not full AGC action is obtained. Nevertheless, in practice, the receiver gives a good account of itself despite these compromises, and provides quite respectable performance. Dynamic range is sufficient for all but the most hostile receiving locations. After alignment and adjustment of the AGC, the receiver is sensitive and pleasant to operate. All amateur bands are forward tuning. The prototype has the following characteristics:

Performance

Frequency Range:	Basic range 3-4MHz, then any 1 MHz band from 7 to about 28MHz (see table)
Reception Modes:	SSB USB/LSB, CW, DSB, and AM (as SSB)
Sensitivity:	0.3uV for 10dB S + N : N.
Stability:	Less than 100Hz drift in any hour
Image Rejection:	Worst case 50dB on the highest band
Internally Generated Spurious signals:	Notable birdies at 3.33, 7.5, 9.5, 14.0, and 15.5MHz, plus harmonics of the BFO crystal
First IF Rejection:	75dB of a 3.5MHz signal when tuned to HF
Second IF Rejection:	71dB of a 5MHz signal when tuned to 3.5MHz.

Circuit

Basic tuning range is nominally 3-4MHz. Signals in this range must negotiate the 3-4MHz tuned filter which tracks 5MHz below the VFO. An MFE131 dual-gate FET provides a degree of RF gain or loss to signals before they are applied to an NE602 balanced mixer chip. A LED is inserted in series with the FET source to increase AGC range. The input attenuator is useful for dealing with particularly powerful signals. Local oscillator VFO, which operates 5MHz above the input frequency, is applied to the oscillator port of the NE602 (the internal transistor within the NE602 can, and usually is used to provide the LO signal. However, for best results, and to minimise the production of spurii, the oscillator should be a separate unit, isolated off the chip from the remainder of the mixer circuitry).

The resulting IF signal at 5MHz is matched and applied to a crystal ladder filter comprised of four identical 5.0MHz computer crystals. The value of coupling capacitor shown, 33pF, yields a bandpass of about 1.7kHz, which probably represents a fair compromise for CW and SSB work. Smaller values of C (eg 27 or 22pF) will give wider bandwidths.

The choice of 5MHz as the IF was quite arbitrary. A round number IF means the VFO must generate a signal which relates directly to the receive frequency (those digits to the right of decimal point where MHz are the whole-number part). If a digital readout is desired, counting a VFO which tunes 8-9MHz can be done easily without need for further manipulation. Naturally, other IFs, such as 4.433 or 5.068MHz etc may be used if preferred, and the VFO range altered accordingly. Another MFE131 does duty as product detector. BFO signal at either 4.9994MHz or 5.0014MHz, placed at either end of the crystal filter bandpass, is applied to G2 of the MFE131 to obtain LSB or USB reception. The single 5MHz BFO crystal is pulled either high or low with series C or L respectively (the 3-4MHz to 5MHz conversion inverts the sideband, so 5.0014MHz BFO gives USB reception) Product detected AF appears at the drain, where RF energy is removed through the simple LC filter.

A LM741 followed by a LM386 raises the AF signal to headphone or loudspeaker level. A sample of AF is picked off at the output of the '741 and applied to another '741 acting as AGC amplifier, where it is rectified, the 1µF capacitor charged, which drives a DC amplifier to supply AGC control voltage back to the RE amplifier. RF gain is also manually adjustable via the 20K RF gain pot.

For reception of signals in the 7-28MHz range, the input is routed via the converter

circuit. A three section top-coupled bandpass filter is manually peaked so that the chosen band is presented to the input of the NE602 balanced mixer. An MPF102 maintains the selected crystal in oscillation, which should be exactly 3MHz below the desired band, eg to receive 7-8MHz, we need a 4MHz crystal (f - 3 = 4 and so on. The table shows the bands obtainable with standard computer crystals). The 3-4MHz first IF is extracted from the balanced output of the NE602 through a broadband transformer, where it is applied to the "input" of the basic receiver.

A band not available is 8-9MHz, being the same as the VFO frequency. More importantly, it was found that the 5MHz conversion crystal frequency interferes directly with the IF. 9-8MHz is available if essential, as a backwards tuning band using a 12MHz conversion crystal, so the birdie will only appear at 8.5MHz.

Construction

It is suggested that the basic 3-4MHz section be tackled first. For this project it may be assumed that the enthusiast who contemplates building a multi-band receiver will know where to lay hands on many of the "hard-to-get" items required for a job of this kind, although the only perceived obstacles for the relative newcomer are perhaps the acquisition of wafer switches, a 3-gang variable capacitor with 200, 300 or 400pF per section for the 3-4MHz receiver section, and a three-gang variable capacitor of similar capacitance per section for the converter. The capacitor for the converter is not critical, provided all three gangs have identical value.

For the main receiver, the builder may have to do some maths and experimentation to fit the capacitor to the task. Maximum and minimum total C are shown on the circuit as a guide. A three-gang 200pF unit is to be preferred, as best linearity of tuning will be obtained (a larger capacitor with series fixed C compresses the tuning at the high end, and tracking will be poor). If only a 300 or 400pF unit is available, capacity may be reduced by extracting the surplus portion of the moving plates of each gang. For example, a 400pF with 18 plates each may be converted to about 200pF by removing half the moving plates. A jeweller's piercing saw is probably the best tool. Carefully cut through the supporting spacer to isolate the unwanted individual outside plates, then extract them one at a time with long-nosed pliers. Make sure no swarf gets into the plates or bearings.

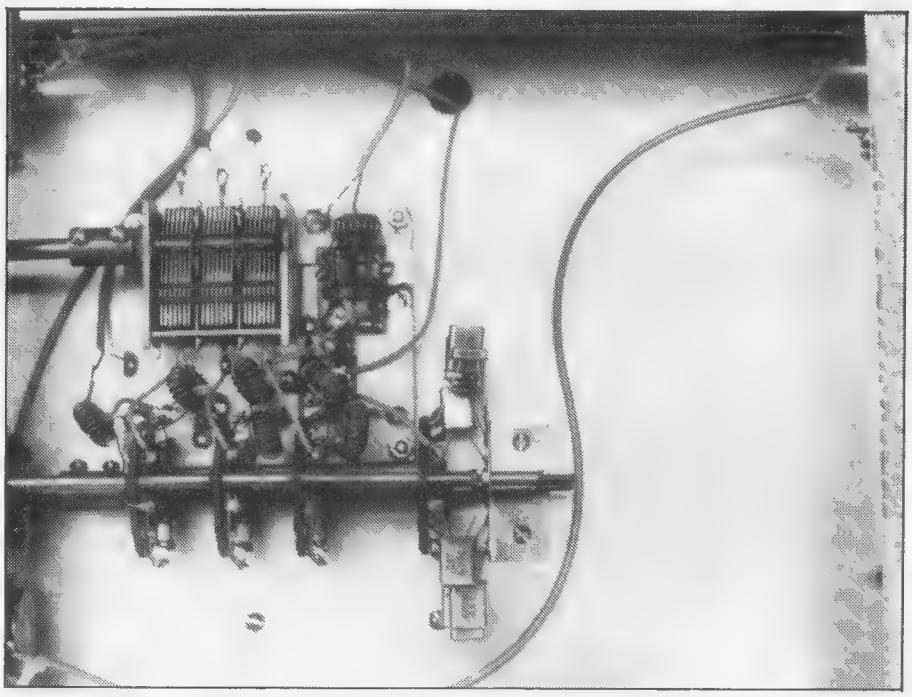
Naturally, a wider tuning range may be employed if desired. For instance, if the basic range is made 3MHz to, say 4.2MHz, then we will have a range of 9-10.2MHz with a 6MHz converter crystal (stock 7MHz for the 10MHz band are not known to be available), thus covering the 10.1MHz band. Similarly, a stock 24MHz crystal will allow a 27.0 to 28.2MHz range (25MHz crystals are available from some suppliers)

Wafer switches are ideal for bandswitching, especially the kind that you can make up to requirements. Configure a 4-wafer/11 or 12-position combination, three wafers for the converter filter, and the fourth for the crystal selection. Wire the filter wafers with the 12MHz break point appropriate to your chosen bands (the circuit shows this function schematically simplified) For the prototype, the 7, 9, (10) and 11MHz bands occupy four positions, all wired together, then 13MHz and above occupy the remaining positions. Retail suppliers cannot, as far as I know, supply wafer switches of this type. They are by no means a mandatory requirement however. The 7-12/12-28MHz selection could be done with an ordinary 3-pole/2-position wafer, and the crystals selected with a l-pole/l2-position switch. (It was hoped to cover 7-28MHz with just one set of two coils, but image and sensitivity problems due to poor L/C ratios were significant. Two sets of three coils were found by experiment to provide acceptable image rejection and sensitivity across the mid to upper HF range).

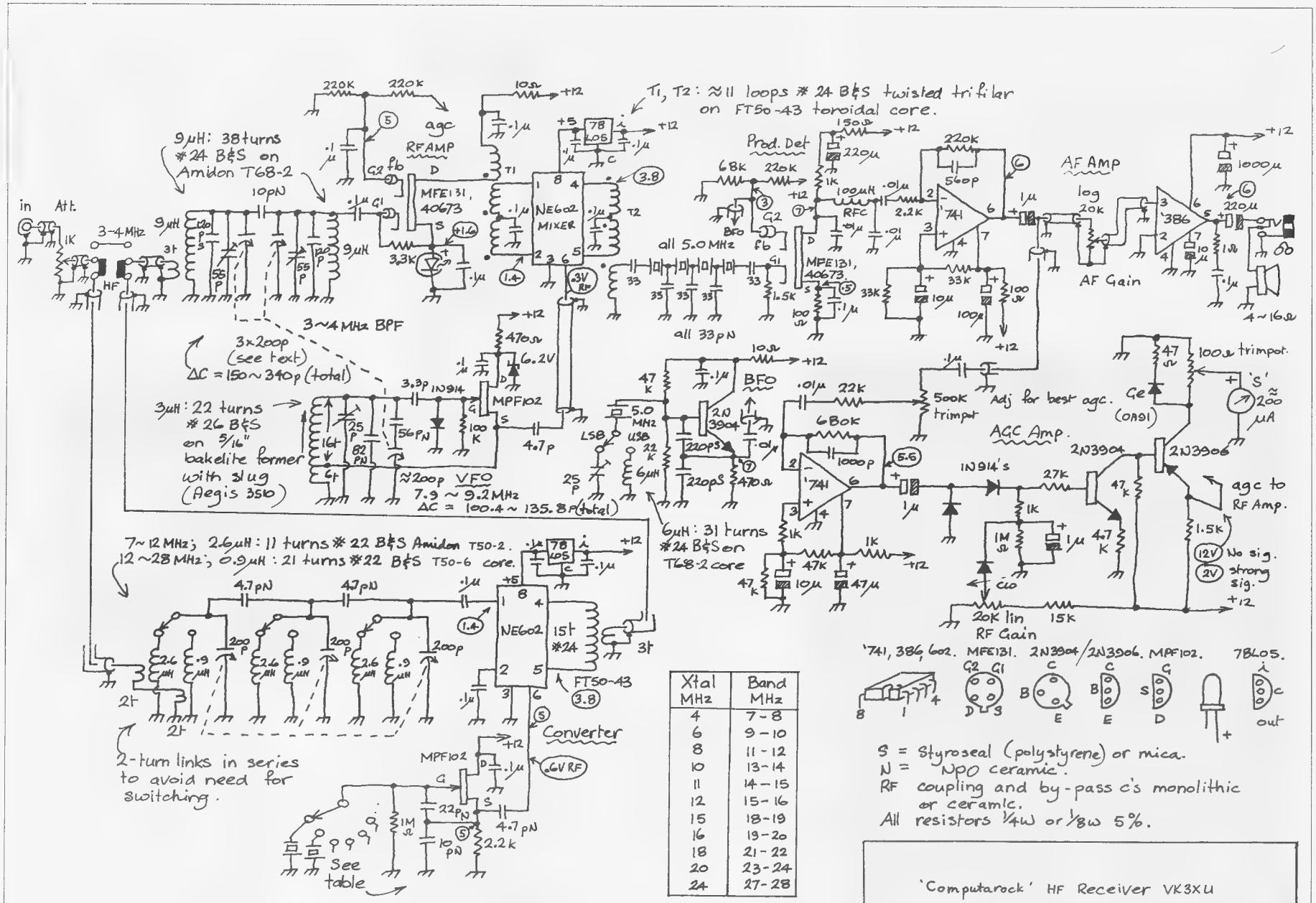
The physical shape of the prototype (rather an ugly duckling - but I've grown to like it) was largely dictated by the deluxe 3-gang variable capacitor/worm-drive/dial assembly (very similar to the "Command" receiver capacitor) which was on hand. So it was decided to fit the assembly upright, and fix the circuit boards upon two vertical chassis panels as shown. The transformer and power supply components are located upon the rear panel, converter circuit on the left panel, basic receiver on the right panel, and VFO in the space between. The panels thus form a screened area for the VFO, effectively separating the three sections, and gives a shipshape rigidity to the whole assembly.

Circuit boards (or whatever wiring method is chosen) are as follows: RF amplifier/ mixer/crystal filter/product detector, AF amplifier, AGC amplifier, BFO, VFO, power supply and converter/bandswitch.

A 12V regulated supply is necessary. Peak current demand is about 100mA, although extra capacity should be provided if dial and S meter lamps are required. The standard 2155/15V transformer with four-diode bridge and 7812 regulator configuration is ideal. If a mains supply is used, be sure to include a 500mA fuse in the line side of the 240V mains supply, and switch both conductors with a DPDT switch. Mains earth must be connected to chassis ground with a dedicated screw, solder tag, lock washer

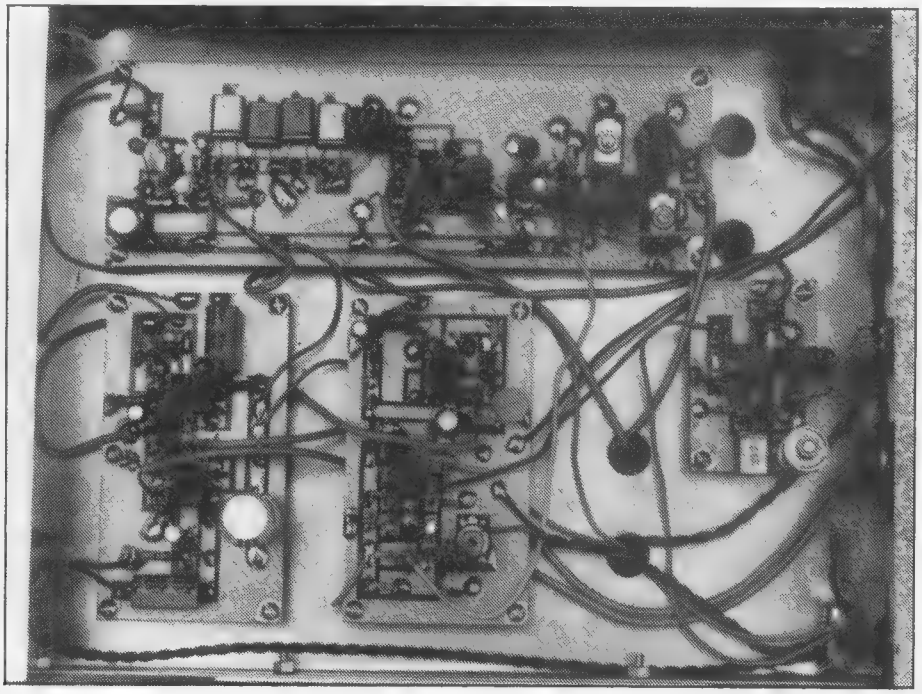


Converter assembly.


T1, T2: ≈11 loops #24 B&S twisted trifilar on FT50-43 toroidal core.
9µH: 38 turns #24 B&S on Amidon T68-2
3-4 MHz BPF
3x200p (see text)
ΔC = 150~340p (total)
3µH: 22 turns #26 B&S on 5/16" bakelite former with slug (Aegis 3510)
≈200p VFO
7.9 ~ 9.2 MHz
ΔC = 100.4 ~ 135.8pF (total)
6µH: 31 turns #24 B&S on T68-2 core
7~12 MHz; 2.6µH: 11 turns #22 B&S Amidon T50-2.
12~28 MHz; 0.9µH: 21 turns #22 B&S T50-6 core.
2-turn links in series to avoid need for switching.
See table
Converter
Prod. Det
AF Amp
AF Gain
AGC Amp.
BFO
RF Amp
agc
Adj for best agc.
500k trimpot
RF Gain
'741, 386, 602. MFE131. 2N3904/2N3906. MPF102. 78L05.
S = Styroseal (polystyrene) or mica.
N = NPO ceramic.
RF coupling and by-pass c's monolithic or ceramic.
All resistors 1/4W or 1/8W 5%.

Xtal MHz	Band MHz
4	7 - 8
6	9 - 10
8	11 - 12
10	13 - 14
11	14 - 15
12	15 - 16
15	18 - 19
16	19 - 20
18	21 - 22
20	23 - 24
24	27 - 28

'Computarock' HF Receiver VK3XU



3-4MHz receiver section.

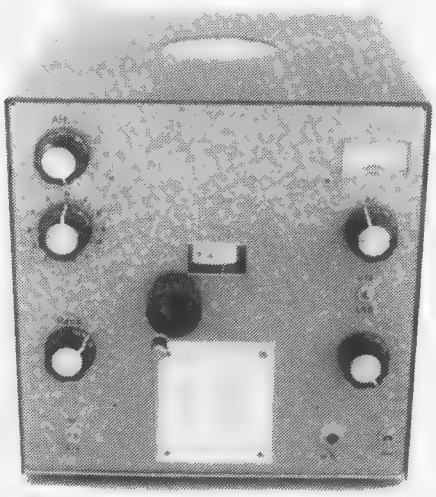
and nut. All connections must be adequately covered to prevent accidental contact.

Further notes on construction may be gleaned from Ref (1), and additional information also from Refs (2-4). Most of the home-made circuit boards relate closely to the Super DC receiver, and may be individually adapted to suit your own model. Indeed, there is no need to wire the thing using printed boards. This receiver worked entirely satisfactorily during the breadboard phase, blobbed up on scraps of printed board using the "ugly" method, so we may safely assume that just about any well-known RF construction method will give satisfactory results, providing the general layout is observed. For best stability, use polystyrene (styroseal or silvered mica if available) and NP0 capacitors where indicated. Miniature 50 ohm cable was used for the coax connections.

Alignment

VFO range must first be established. Set the 25pF trim capacitor to mid travel. Adjust the slug of the VFO coil so that; with rotation of the VFO tuning capacitor, about 7.950MHz is generated at max C, and 9+MHz at min C. The inclusion of the trim capacitor is based on experience, and may be found useful at some much later date to provide top-end adjustment and alignment of the dial, made necessary by any change with time of VFO component values.

Connect an antenna to the receiver input. A few metres of wire will probably do. Set the RF pot to maximum gain. If there is fluorescent lighting, or HV power lines nearby, you should hear some line-related noise. Tune the receiver to about mid-band (3.5MHz) Peak the two 55pF trim capacitors for maximum noise. Sensitivity should now be reasonably flat across the band. Sub-microvolt signals at night should be easily detectable, and the set should sound lively. Find a fairly strong CW or RTTY station. Adjust the 25pF trim capacitor in series with the 5MHz BFO crystal so that a strong heterodyne is heard on one side of zero beat, the heterodyne being much weaker as you tune through to the other side of zero beat (about 1/5 mesh or 5pF) No adjustment is provided for the series coil- you may wish to substitute a coil and slug of about 10µH here to permit a more accurate setting of the BFO frequency for USB signals.



"Computarock" HF receiver.

The 500kW trimpot at the input to the AGC amplifier is adjusted subjectively to what the user regards as most pleasing AGC action, ie find the point where AGC action occurs, but is free from attack pop and click on strong signals. This should occur near the top end of the trimpot range. Monitor the AGC voltage at the emitter of the 2N3906. Weak or no-signal voltage should be about 12V. When a strong station is tuned, the voltage should quickly drop to about 2V. The S meter trimpot is set for FSD on a strong signal. Anti-clockwise rotation of the RF gain pot should cause the S meter to indicate upwards to FSD.

When the converter is in use, there will be two or more sharp "peaks", separated by about 30 degrees rotation, as the input filter is tuned. One of the peaks will be the required band, the other(s) will be an image band. For instance, with a 16MHz conversion crystal, desired forward tuning of 19-20MHz will be obtained. Another peak will be found at 13-12MHz, tuning backwards, and is there if you want it. If the desired band has a grouping of two or three closely spaced peaks, you can bring them closer together if you wish by experimentally bunching or stretching the turns (thus altering the inductance) of the appropriate coil. A look-up table of switch positions and tune settings may be typed and affixed to the front of the set to allow rapid band changing. Harmonics of the conversion crystal may also give access to other bands. For example, the second harmonic of the 11MHz crystal; 22MHz, will give usable 19-18MHz coverage (22-4=18, 22-3=19), and, once again- is there if you want it (got some time to spare? Just for fun, work out some of the others, there are many possibilities). Cunning use of the converter input filter will sort these out.

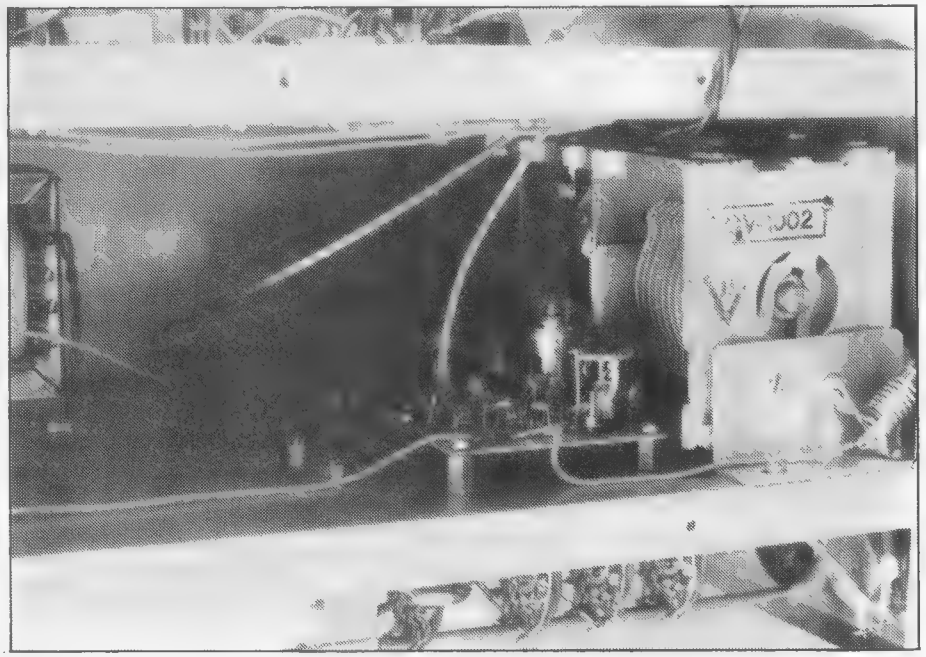
Problems

Some key voltages are shown on the circuit as a guide to any necessary trouble-shooting. The DC voltages were measured with respect to chassis with a high-impedance DMM, and RF levels with a standard diode probe. A voltage which differs significantly should indicate a problem area. If the VFO or conversion oscillator will not work, try another MPF102 (some cheaper

makes are, I suspect, "from the bottom of the barrel"). If you cannot get your receiver to perform satisfactorily, or consider that it will not work properly due to some mistake or oversight herein, or require further details; please write, and any reasonable amount of help will be returned. For reply, an SASE would be appreciated. Interested constructors may inspect the prototype at the writer's QTH after first confirming on (03) 722 1620 outside work hours.

Parts Sources

All FETs, chips, trim capacitors and Amidon cores are available from Truscotts Electronic World (03) 723 3860, and Stewart Electronics (03) 543 3733 (the writer has no connection with either firm). Other Amidon suppliers advertise regularly in this journal. Shop around for best price and range of computer crystals - best I've seen is around $3 each from a well-known computer/electronic parts supplier. The NE602AN has measurably better intercept characteristics than the earlier 602, so try for the latest version available. Vintage radio shops, radio clubs or disposal sources may be able to help with ganged variable capacitors. The Aegis 3510 bakelite coil former for the VFO may be difficult to find. Truscotts have a supply of ordinary IF transformer type 5/16" coil formers which would reasonably suit.



VFO and main tuning gang.

References and Further Reading

(1) Super-DC Receiver - Diamond, VK3XU, AR, May '90.
(2) Computarock Converter - AR June '91.
(3) DC91 Receiver - *AR*, May '92
(4) How to Lay Out RF Circuits - White, G3SEK, *Rad Comm*, Feb/Mar '91.
(5) NE602 Single Chip Frequency Converter - Covington, *Radio Electronics* April '90.
(6) SSB Receiver for 80m - Williams, VK2DOB, *EA*, Sept and Dec '91.

amateur radio action

"Hουσε αδωερτισεμεντΠ φορ Αματευρ Ραδιο Αχτιον μαγαζινε το αππεαρ ιν ΩΙΑ φουρναλ Αματευρ ΡαδιοΠ."

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If all this looks Greek to you, perhaps it's because you're not reading the authoritative source — Amateur Radio Action magazine... at your local news outlet every fourth Tuesday.

Random Radiators More on Tree Antennas

Ron Fisher VK3OM & Ron Cook VK3AFW

Bob Eldridge writes from Pemberton in Canada. It's nice to hear from overseas readers and his kind comments are much appreciated. Bob was inspired by the November 1991 article to look up the FBTO data base and came up with three articles on tree antennas. Bob has sent photocopies of these and they are summarised below:

Shunt Excited Tree

This article was published in the May 1989 issue of *CQ Ham Radio JA)* according to page 26 of the May issue of *73* magazine. JA6HW and JA6AUI are reported to have carried out a series of experiments on live trees. A matching unit is described for a 12ft tree on the 10m band. Using 50 watts CW SSB and FM they worked stations in the US, Europe, Asia and Australia. An L match type of ATU is used at the base of the tree. One terminal connects to an earth stake and the other to a wire which runs parallel to the trunk to the tapping point. The connection to the tree is accomplished by a stainless steel bolt screwed about 30mm into the trunk. It appears that the tapping point was about 3ft up the trunk.

Field strength tests showed that the tree was the main source of radiation, not the matching wire. Most of the radiation was vertically polarised, but some horizontal radiation from horizontal leaves was noted.

Bob added some comments about his own experiments with trees.

"Notice that the input terminal doesn't go very far into the tree. This makes sense if the bark is very thin. I made some experiments with cottonwood trees (a kind of larch), which have thick bark, and found you have to get through the bark and past the layer where the sap runs. But there is not much to be gained by going further into the hard wood except in the case of a tree (like the cottonwood) where there is a heavy flow of sap right in the centre. Trouble is, you don't know just where the effective centre is, although if you drill in from the north it is somewhere north of the geometric centre and about centred east and west. I suppose for you upside-down people you would go in from the south."

HEMAC

Another method of coupling the RF into the tree is a Hybrid Electromagnetic Antenna Coupler (HEMAC) which was devised by Dr Kurt Ikrath. Bob has sent copies of two articles on this device. The first is from *Ham Radio* magazine May 1974, page 4. The HEMAC is a coil wound in toroidal form around the trunk of the tree. The coil is air wound and held to the tree by means of a strap which is probably made of plastic. Two taps are made onto this coil, and connection made to a matching network which provides a match to a coaxial feed line. Tests showed an improvement of up to 22dB over a comparable whip, particularly in wet jungles. Two trees were used to provide a steerable phased array. The HEMAC was also used to couple to metal utility poles and humans. Coupling to the belly did not work, but other parts of the body did. Fat people made better antennas than thin ones. *The two Rons do not advise coupling of transmitters to humans as overheating and consequential injury may occur, particularly if power levels above one watt and frequencies above the HF spectrum are used.*

The second article on the HEMAC was printed in *73* magazine of January 1975, page 21, with feedback on that article in the March issue on page 7.

It states that the HEMAC acts like a transformer with the tree being a single turn secondary. It was found that lower frequencies were absorbed less by the surrounding forest, but the height of the tree was also important. A 100ft tree worked best in the 80m band, for example.

Bob also cites an article from *CQ* magazine of April, 1978, page 79, on using a tree on 160 metres, but was unable to supply a copy. Maybe another reader can help.

Bob continues -

"I use 160 most of the time, and the tree I suspend the vertical loop from is about 130ft tall. Despite all the top loading it may resonate at 160, because it sure makes a difference in antenna resonance if I move the apex (a voltage antinode) towards and away from the tree. Also, I can certainly measure re-radiation from the trunk of the tree with an MFJ RF current probe (incidentally, an instrument I find very useful not only for finding current reversal points and polarisation etc, but also for RF sniffing around the shack and the house).

I may as well mention while writing that the MFJ SWR analyser is quite useful too. But it may be a good idea to mention to your readers that it doesn't really look for SWR, it looks for 50 ohms. So if you are using 75 ohms cable?

Lamp cord: Ours is probably radically different from yours, because many years ago we used some for receiving antennas because it measured about 70 ohms impedance. It was okay for that because we were not concerned about the efficiency. But the loss per 100 feet was very high even at 2-10MHz, so it didn't work worth a damn for transmitting, and got quite warm at 100 watts or so. We tried some flat AC cord (the kind you can peel apart, but it got twisted) and it was even worse.

A practical matter I haven't seen covered is the usefulness of using pulleys instead of insulators at the corners of wire loop antennas. With a vertical Delta, for example, it is quite difficult to predict just where the insulators should go at the bottom corners to end up with the base wire reasonably taut, and the whole thing has to be hauled up and down several times to get it right. With pulleys it self-adjusts. One becomes aware of the problem when there is a couple of feet of snow on the ground or the grass is 6ft tall.

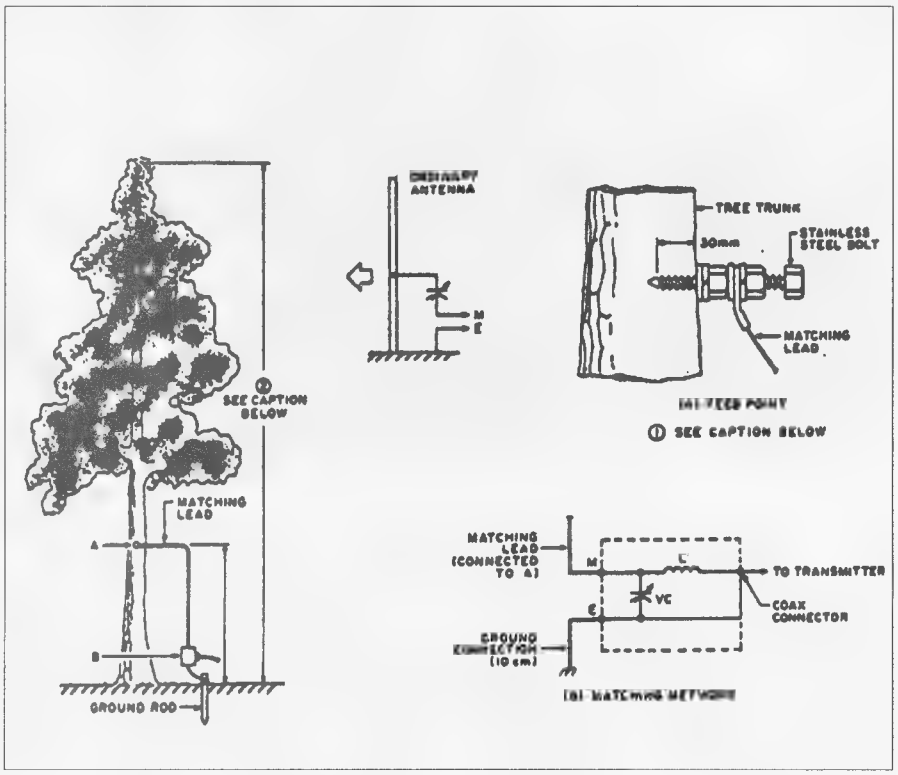
The same applies to a horizontal loop. I have one about 600ft around, roughly square and above thick grass, brush and trees, gardens etc, and I find letting the wire slide through insulators just doesn't work well. Mostly because I have taped connections here and there because of my "try adding 30 feet", "add another seven", "add another three" method of "tuning".

Your suggestion that 275W input AM is equivalent to about 600 watts PEP output on SSB gave rise to some interesting discussion around here, as you seemed to be looking at the **spacing** on the capacitors. We more or less agreed between ourselves here that "275 watts input" meant "275 watts unmodulated input to the final" in those days, equating to about 200 watts output, which when modulated produces about 400 watts PEP. But then we considered that AM puts a considerably greater stress in duty cycle for **current flow,** so maybe taking everything into account, your figure may be right. I had a 275W Matchbox one time, and regret having given or sold it to someone. I have a 1kW one stowed away in the attic, but it has a totally different design as you probably know, and is very big.

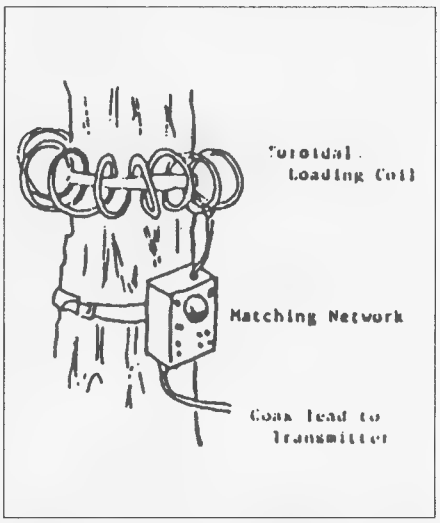
Now we figure it this way. Two hundred and 75 watts of AM is 275 watts of DC input plus the modulation signal which doubles the supply volts and the plate current at 100 percent modulation (high level plate modulation assumed). Thus the total input is four times 275 watts, or 1,100 watts peak. If we assume that allowing for average efficiencies of the modulated final and output tank circuit that an effective efficiency of 55 percent is obtained, then the PEP output is 605W PEP. It should be noted that while the average power for a 100 percent sine wave modulated final is increased by 50 percent, the peak power is increased by 400 percent. An ATU designed to handle a 1kW input AM rig could handle more than 2kW PEP output. Old timers will remember that 100W SSB rigs had smaller components in them than 100W AM rigs - some of us were most surprised that they worked without sending out smoke signals of distress.

That's all for this time, so it's 73 from me and 73 from him.

The Two Rons



A tree antenna. 1. C: 70pF 500V variable capacitor, adjusted about halfway in; L: 0.9μH coil. 2. Tree used is about 3.73m high, diameter at A is 12.5cm; at B 16.6cm.



HEMAC in position on tree. (Drawing courtesy *73* magazine, January 1975).

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Homemade Spectrum Analyser

Paul Kay VK4SY
20 Gilbert St
WINDSOR 4030

Very little has been described in amateur radio magazines concerning the spectrum analyser, its theory and operation or how to build one. There is no denying a spectrum analyser is a most complex piece of equipment. The complexity can be reduced by modular construction. But first, what is a spectrum analyser and what does it do and how?

An oscilloscope displays signals in the time domain as an amplitude-versus-time graph. The RF spectrum can be displayed as an amplitude-versus-frequency graph and, for that, we need a spectrum analyser.

This article shows how to build a simplified spectrum analyser. A spectrum analyser project is unique for most of us amateurs, and might cause some uneasiness at first. However, by following the steps outlined in this article, a usable spectrum analyser can be built. A store-bought spectrum analyser is nightmarish in complexity and very expensive. Yet a homemade unit can be built to reasonable performance by following the guidelines.

1:
By using a mass-produced TV tuner front end that covers the 35-90MHz frequency range with good sensitivity.

2.
By using economical consumer priced modules for IF, selectivity, detector, oscillator and audio sections.

3.
Using your own CRO as a display unit.

4.
Modular, repeatable construction.

This spectrum analyser uses the double conversion principles to translate on the screen any frequency between say 35-910MHz (see fig 1). Signals arrive first into varactor front-end module. This selects the frequency we wish to monitor. This module feeds into second conversion module using the receiver section of a handheld CB radio that boosts the signal and provides needed selectivity. IF frequency in this module is 455kHz and uses ceramic filter for selectivity and ample stable gain to feed an AM detector. We need an amplitude detector to drive the vertical amplifier in our display section. The base line (grass) must not shift on varying signal levels and is referenced on zero or chassis earth. Only two modifications are needed in this module, namely the RX Xtal of 26785kHz has been substituted by the 27240kHz Xtal at present in TX position. This reduces CB breakthrough. An OA91 diode and a 3.3k resistor in parallel with a 22nF capacitor has been added to the last IF providing a separate detector to provide the output to the CRO of the required positive polarity for CRO. The audio section is intact, and the mute pot is wired off permanently. RG178 miniature coax is used between the IF section and the CRO display and for aerial input. A 47pF capacitor couples the varactor tuner IF output to the CB module aerial terminal. A three-position rotary switch selects the frequency range, either VHF Low or High or UHF. All frequency band limiting components are omitted so there is a fair amount of overlap between the switch positions. The low end starting about 35MHz with the high end just covering the cellular telephone band around 910MHz.

A purist might object to having a spectrum analyser with an audio section included, but it's there anyway. It's a bonus already built in to the modules as they come. (See fig 2).

Four of these units are in almost daily use now. Some have FM sound and a slightly different front-end module, and some are AM sound. Any combination of these has been used with good results; this particular article uses AM board for IF and detector section.

The very first unit was built to check various modules. They all work and they work well considering their simplicity and low cost. None of the components used is a one-off unit or hard to obtain or unobtainable. Almost 90 percent of the components come from garage sales or Sunday flea markets. For example, a pair of Ferris HF3000 hand-helds used here cost just $10, and two BETA VCRs for a total cost of just $40. A box for a two-way radio cost just $5. Just strip out what you need and discard the rest.

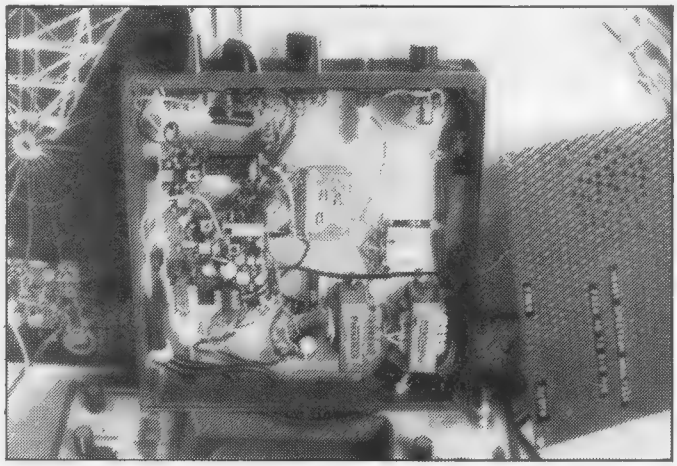
Construction

The unit is housed inside the case of the defunct two-way radio built by Willis. All parts were removed and the case given a coat of paint. PSU components were installed on the bottom plate, which is used as a chassis. Although the inside area is only $7^1/_2$ x $7^1/_2$ it's more than enough. Parts and modules occupy only about half the space available. A small speaker is mounted on the top plate. All controls are on the front panel. Coax leads to the CRO and the aerial and mains lead are on the back panel. Total height is just under two inches. This cabinet has plenty of room for future additions.

The LM317T voltage regulator is three-terminal type, and is bolted against the bottom plate using a normal mounting kit. Heatsink compound is not needed as it runs barely warm to touch. The varactor tuning voltage is derived from a voltage doubler and is Zener regulated for simplicity.

Note: This voltage must be stable without any hum or ripple. Remember, this voltage controls your incoming frequency. Any hum causes blurry cusps on the CRO display. Larger variations shake signals left and right across the screen. We need only a

Internal view of spectrum analyser - PSU is in top left-hand corner.Mitsumi tuner is in the middle, and the Ferris HF3000 board is on the right.



The complete spectrum analyser.

few milliamps to control frequency. The CB board needs about 50mA on low volume; this is sufficient for normal use. Adjust the 5k preset to give about +13V for the IF board. It goes without saying that all the components have to be rigidly mounted, and leads carrying 240V AC must be shielded properly and away from other components.

Display

For display purposes an oscilloscope is used. Any CRO will do here. The author has been using an ancient HP6288 round face as well as D/S LAB. CRO (ex-garage sales) and also a leader LBO507 square face. If a round-face CRO is used, the grass line is adjusted across the middle of scope screen. A square face is a bit fancier, as you can bring all the action to the bottom of the display. It's necessary to use an AM detector here as all the action is ground-up, that is to say, above ground level. The time constant of this RC combination must be sufficiently short to avoid any unnecessary stretching of the AM signal slope. In other words, display rise and fall times are fast. A combination of 3.3kohm and 22nF is just about right. The resistor can be increased if your CRO is insensitive, but leave capacitor alone. Direct coupling is used to preserve good low-frequency response.

Any AM CB board will work fine without any touch-up as is, but the detector diode should have the right sense, that is, positive pointing towards the CRO vertical input. No harm is done if diode is the other way, except that your display is inverted.

We also need horizontal sweep voltage from the CRO. This is easy. Just connect an 82kohm resistor to the point that feeds the horizontal deflection plate on the CRO tube. Bring this voltage to your spectrum analyser using mini-coax. T his voltage, as you can see in the circuit diagram, is superimposed on the varactor tuning voltage, thus scanning the segment of the RF spectrum of your choice. See fig 3.

The sweep voltage is not AC as such, but a fast-changing DC voltage. It does not spin 180 degrees however (almost) never cutting the zero line. Use mini-coax and BNC connectors for CRO input and output. Older CROs, however need different connectors. About 15V sweep voltage is required for tuner operation. Any CRO can supply more than this, so a dropping resistor is needed to limit the full swing.

Propagation can be observed visually. Pile-ups show on screen without spinning receiver dial back and forth. The spectrum analyser resolves FM-AM-SSB signals as well as harmonics and other spurs. In a spectrum analyser, complex signals are separated into their frequency components, and the relative levels at each frequency are displayed. The frequency domain is a graphical representation of signal amplitude as a function of frequency.

The spectrum analyser thus described can be built by anybody with an average toolbox and knowledge of radio. With a normal TV aerial it is possible to observe 6m activity, band openings, fadeout etc. TV and FM stations come in from at least 50km away, with video and sound carriers visible.

All in all, this spectrum analyser project

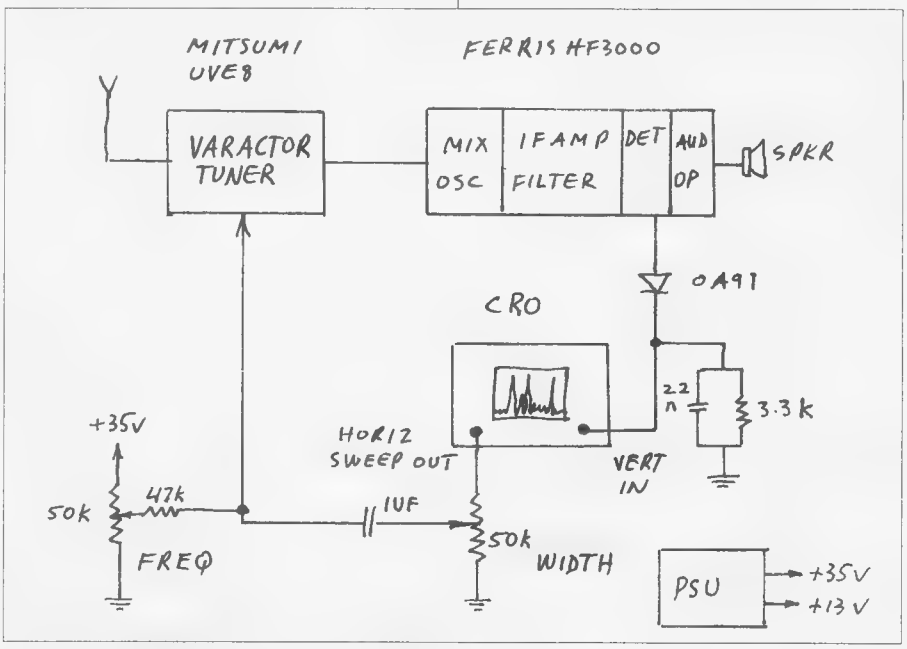


Fig 1: Spectrum analyser block diagram.

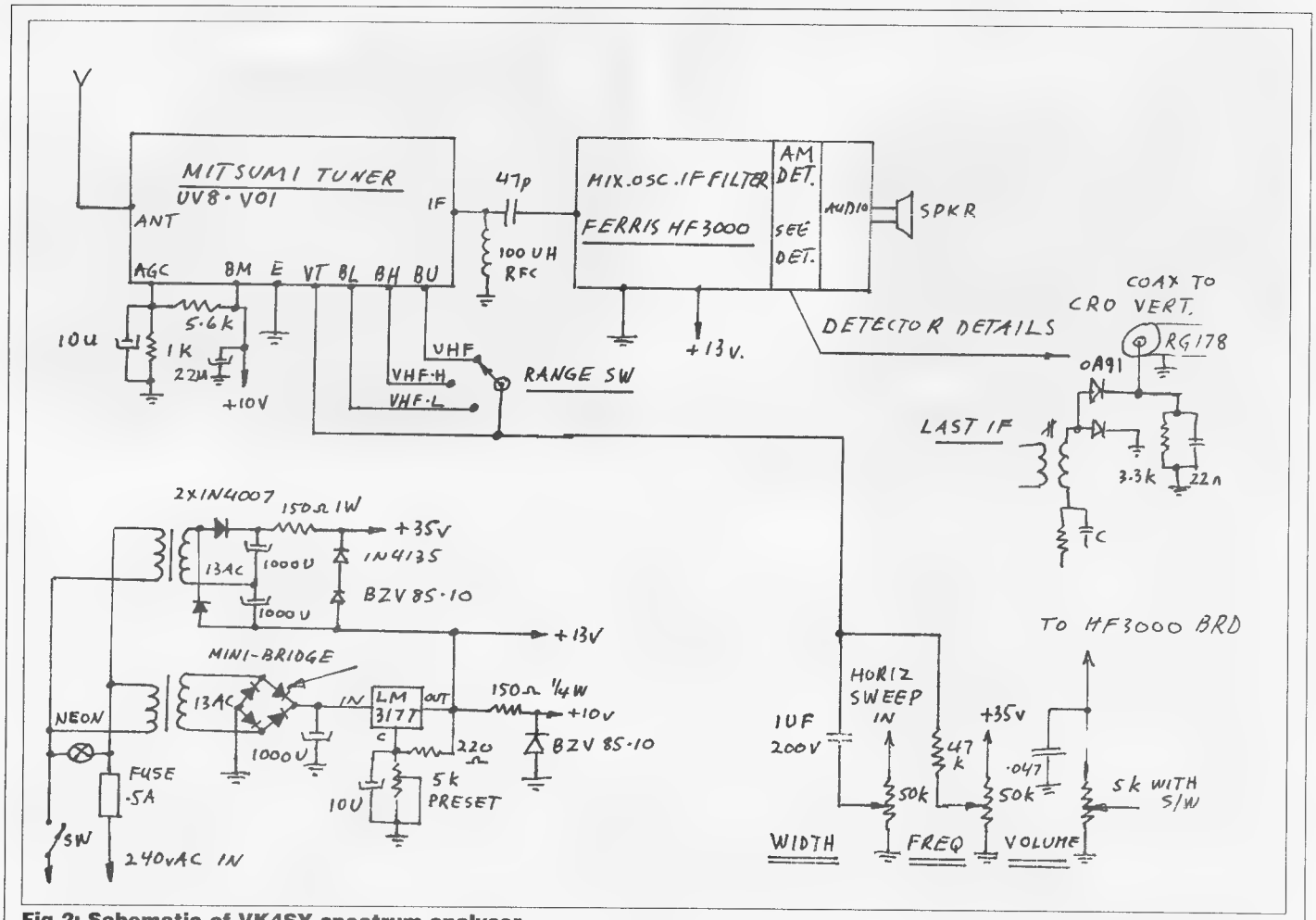


Fig 2: Schematic of VK4SY spectrum analyser.

has been a practical solution for a most useful item of test equipment.

References

High-Performance Spectrum Analyser, by Wayne Ryder W6URH, *Ham Radio*, June 1977.

Low-Cost Spectrum Analyser with Kilobuck Features, by Robert M Richardson W4UCH, *HR*, Sept 1986.

Panoramic Adaptor/Spectrum Analyser, by Rick Ferrsnti WA6NCX, *HR*, Feb 1983.

Practically Speaking, by J J Carr K4IPV, *HR*, Feb 1990.

Parts Summary

Resistors: 1 x 150 ohm; 1 x 220; 1 x 1k; 1 x 3.3k; 1 x 5.6k; 1 x 47k; 1 x 82; all $^1/_4$ w; 1 x 150 ohm 1 w; 1 x preset 5k.

Caps: 1 x 47pF cer; 1 x .022 µF greencap; 1 x .047µF greencap; 2 x 10µF 25V; 1 x 22µF 25V; 3 x 1000µF 25V.

Diodes: 1 x OA91; 1 x 1N4135; 2 x B2V 85-10; 2 x 1N4007.

Miscellaneous Parts: 2 x 50k pot lin; 1 x 5k pot log S SW; 1 x 100µH RFC; 1 x S/W - 3-position rotary S/W; 2 x 240/12V transformer; 1 x fuse .5a; 1 x 1m 317T regulator; 1 x minibridge MR RB154; 1 x 5pkr; Mitsumi µV8, vol varactor tuner; Ferris HF 3000 board or similar; Midland - Tokai AM boards, knobs; AC lead. **ar**

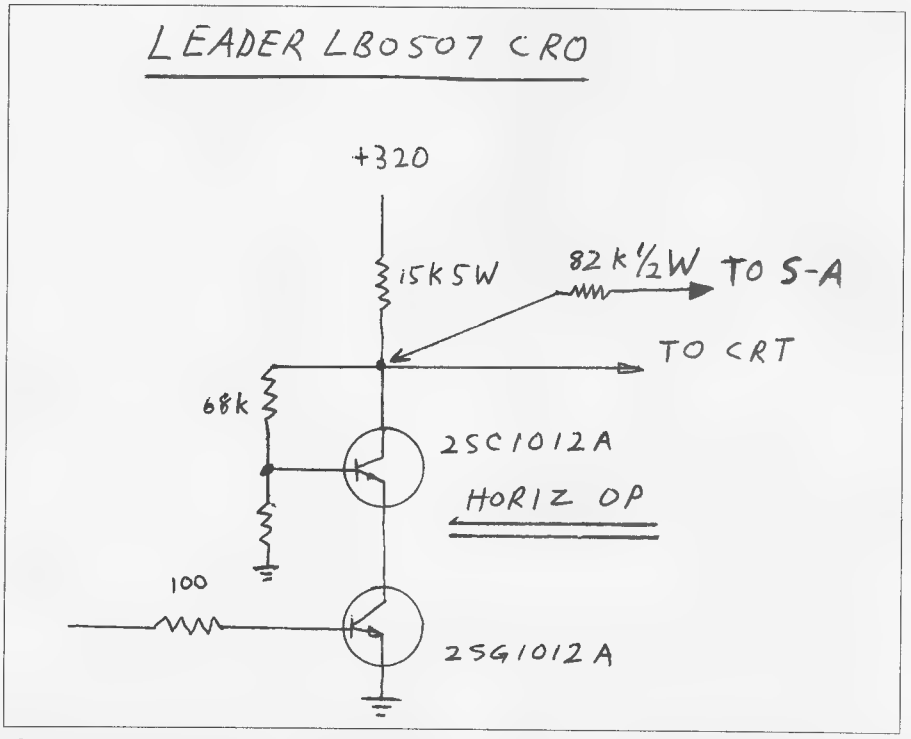


Fig 3: Horizontal sweep for spectrum analyser.

Matching to the Base of a Vertical Half-Wave Antenna

A Simple Method

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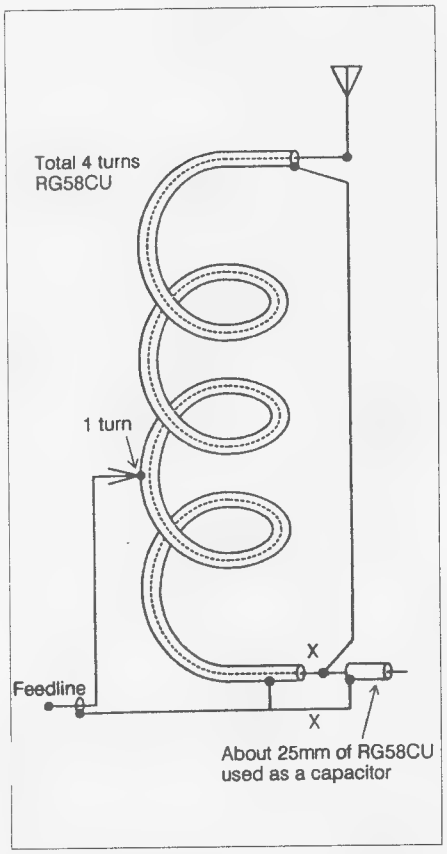
A quarter-wave type antenna needs a complementary earth, counterpoise or radial system to achieve resonance, whereas these are not required with a half-wave vertical radiator which, furthermore, has better low-angle radiation characteristics. Matching of the feedline to the former is not difficult as both antenna and feedline are of low impedance. With a half-wave antenna, the high impedance at its base requires that more care be taken to correctly match it to a low impedance line such as a coaxial line having a 50 ohm surge impedance. It is usual to make use of a parallel tuned circuit appropriately tapped down the coil to match into the feedline, the top of the coil being connected to the base of the antenna and the outside braid of the feedline to the opposite end. Conditional on the feedline being taken down directly below an elevated half-wave antenna to avoid induced line currents from the antenna, there is no need for any other isolating action. However, protection against detuning of the parallel tuned circuit with changes of weather conditions is a problem but, as I have discovered in the construction of many trap multi-frequency dipoles for commercial use, the parallel tuned circuit which can be achieved with a suitable length of coaxial cable alone is practically immune to changes of weather.

Therefore, these factors were taken into consideration when I recently undertook the construction of a whip antenna for operation on 21MHz, which I decided would be an electrical half-wave in length wound on an available 8-ft length of fibreglass tubing tapering down from a base diameter of two inches. (The antenna which I am about to describe is not to be confused with the short *quarter wave* closely wound whip antennas pioneered by the late Queensland amateur Max Swaby, which require almost a *half-wave* length of fine wire to achieve *quarter-wave* resonance against ground).

The construction procedure which I adopted was as follows:

1. The requisite length of wire required for a conventional half-wave antenna was calculated by formula to be approximately 24 feet, and some heavy-gauge enamel-covered wire was cut to that length.
2. The wire was spirally wound around the 8ft length of fibreglass tubing, making the pitch as coarse as possible for better radiation efficiency, but including about six closely wound turns near the centre section. These close-wound turns are for both loading and resonant frequency determination purposes.
3. The assembly was placed in the horizontal position on top of a wooden ladder so the antenna was clear of objects likely to affect its resonant frequency and, by coupling to a dip meter, appropriate pruning of the wire was undertaken, checking with a receiver for frequency accuracy, of course.
4. The parallel tuned circuit made from a length of RG58CU coaxial cable was constructed for operation on the selected 21MHz frequency in accordance with instructions on the subject given in numerous textbooks. My coil diameter was 45mm and consisted of exactly four close-wound turns on the plastic water pipe former to which I was able to add end caps designed for the purpose and which protected the inside connections from rain. A small length of coaxial cable was connected as a trimmer capacitor to prune the circuit to the precise frequency of the antenna (21.1MHz). For the information of readers, a 14MHz coil on a similar sized former required 5.75 turns.
5. The coaxial parallel tuned circuit was then electrically connected to the antenna which had, as stated, been previously adjusted to the requisite operating frequency. On the ladder, the dip meter showed that the frequency had been slightly lowered with the additional coil, but not, as might be considered, by as much as the overall *length* of the coaxial cable. It was only by as much as the actual physical length of the **winding.** This I had discovered many years ago when experimenting with shortened beam antennas. The inductive effect of the coil alone at the end of an antenna is negligible. For the inductance to be effective, a capacity "hat" after the coil is required so that current will flow in the inductance. Thus only about two inches of wire had to be removed from my whip antenna to restore it to resonance as required.
6. The antenna assembly was then temporarily lashed to the wooden ladder so that it now was vertical. The 50 ohm impedance tapping point, about one turn from the bottom end of the coil, was found by using a short length of feedline to an impedance measuring meter. A feedline to a transmitter and some low power using an SWR meter would also do the job. The connection of the braid of the feedline is, of course, to the bottom of the coil, and the tapping point is determined experimentally by tapping the outer protective covering of the cable with a pin to make contact with the braid. The pin was soldered to the inner conductor of



Note: The resonant frequency of the coil is adjusted by trimming a longer piece of RG58CU soldered across point X-X, while checking with a dip oscillator.

the temporary feedline. Having found the optimum connecting point, the protective covering was removed with a sharp knife so the feedline could be permanently soldered to the braid and also to the base of the coil. No doubt a neater job could have been achieved by incorporating a coaxial feedline socket at the bottom of the coil in the centre of the protective cap previously mentioned.
7. I was satisfied with an SWR of 1.5:1, after which the antenna was mounted above a 2m yagi beam so that the base of the whip antenna was approximately 15 feet above ground.

No doubt the coaxial tuned circuit could be adopted for use with a full sized vertical radiator, but with the complication of first determining the resonant frequency of the antenna alone. However, it is likely any minor reactance from an antenna slightly off resonant frequency could be compensated for by adjustment of the coaxial tuned circuit when it is actually connected to the antenna. The tapping point for the feedline should be determined once the antenna is in its final position.

Technical Correspondence

Horizontal Loops

There must be many operators very confused with all the articles on loop system antennas, quad delta and other kinds. Yes, there are other kinds of loops and I have tried most of them.

I am using at this time a triangular loop system. It is an obtuse triangle (you purists stay out!) mainly because that is where the trees are! But it does work (on all bands, yes) with the help of an ATU (home brew).

My loop is two wavelengths long in total, and is tuned for VSWR=1 on 3.797MHz. The feed is by 50ohm coax and the tuning is by means of a quarter-wave inverted V cut for 3.797.

The feed point is at the northern end of the loop and the inverted V is connected to the loop. The side of the inverted V connected to the coax centre core is either cut or lengthened to obtain a VSWR of 1. If difficulty is found in achieving this, try opening or closing the angle of the V.

This loop can be used on all bands with the use of an ATU. If 160 (1.830) is the prime band, then another 20m (66ft) is added to the tuning V on the side connected to coax centre core. At present the feed point is at 21m (70ft). One side is at 17m, the other side at 18m. I do intend to raise the height at some time in the near future, but at this present moment cannot find a round tuit!

If the reader has the room I have found that a V beam at 90 degree angle and 1.5 wavelengths long at 3.797 and tuned to optimum with an inverted V at 18m or more will work very well. I have worked all USA states and all CQ zones on 75 with this, plus DXCC. Yes, I do have the cards confirmed! Also on 160m contacts, both CW and some SSB have been made to most parts.

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Book Review by Gil Sones VK3AUI

MICROWAVE HANDBOOK, Vol 2 Construction & Testing. Edited by M W Dixon G3PFR, Radio Society of Great Britain 1991.

This handbook is a must for the serious and not-so-serious experimenter. Whilst primarily concerned with amateur microwave technology, there is a great deal of information for the average experimenter. The chapter on safety is of significance to all amateurs. The hazards and how to minimise and avoid them are very well set out. This is of particular significance to those of us who have a handheld radio.

Chapters on Data, Filters and Construction are very interesting and have a much wider appeal than the narrow microwave field. The information is well presented and very easy to use and understand. Test Equipment and Construction are more specialised but are very interesting. However, the subject of beacons and repeaters is slanted more to the British and European scene and regulations.

Summing up, a most worthwhile and useful book.

Wartime Reminiscences

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After going through the usual wireless course in the UK in 1941/42 I found myself posted to a RAF station in Canada's maritime provinces as a ground W/Op. At this time of the war it was usual for would-be air ops to do further training in this way to gain practical experience.

We were working Hudsons and Venturas flying on anti-sub patrols out over the Atlantic. These patrols are worth a series of stories in their own right, but back to my own. We noted that at night a German station used to intrude onto one of our HF frequencies. It became obvious to us that this station was also working units by the "F" method which many readers will not recognise, so I will explain.

This consisted of sending a message and then repeating it to ensure the recipient had a good chance of filling in any missed groups the second time around. This type of message was transmitted at given times and did not require an answer from the unit. It was used to prevent the receiving station having to risk being DFed and plotted. They were sent in five-letter number groups and sent very fast - about 28-30wpm by extremely good operators. On odd occasions these were interrupted by the receiving station, and a short exchange of about four groups rapidly passed back to base and acknowledged. It became our custom (and theirs) to send little bits of amicable Morse to each other to help while away the small hours. Most readers will know the type of thing, which I cannot include for fear of offending some of your readers; ahem!

This all ended rather abruptly one very cold morning - in more ways than one - when some of our bright lads (and I include myself) were called to the office to find some very official people with odd looking eggs on their caps waiting to have a little chat with us. They had come all the way over the briny from Abingdon Monitoring Station in the UK. We were very quickly informed about the penalties for passing messages to the enemy in wartime, and logbooks containing the German transmissions and our little asides were produced in evidence. What had we to say for ourselves before being shot?

Well, we didn't know that the station we were sending our rapid Morse to was German, did we? And, since the ops at the other end used the same code for mild abuse to us we assumed they were a UK RAF station. This was received with a certain amount of disbelief, but we were off the hook for the time being. We then had to explain to these officers what each little mixed group meant. This was met with amusement, much to our relief! We were then told that the station we were having our fun with was the German Luftwaffe airfield in Merignac. It was the main station for German U-boat co-operation, using Focke Wulf Condors over the Bay of Biscay and the Atlantic. The messages were going out to individual U-boats and aircraft, and the need for F procedure was obvious.

Our frequencies were changed overnight and, after much cautioning and many lectures, we were not charged over the affair. However, much later on in the war I was one of the crew of the first aircraft to land on Merignac (after the German withdrawal). The station and runways had been well and truly plastered with bombs for some time now, and we had to land carefully on the only runway then serviceable. The bomb craters were quickly filled in with rubble, but still needed to be avoided to save our tyres from this rough and ready surface.

Merignac had special memories for me and I went to look at the signals section, or what remained of it. This had been a vital element during the U-boat campaign and had had its share of bombs. I crawled under fallen-in roofing and eventually got to the operators' room. The loot lying there would have been worthy of a gleam in any ham's eye, but alas could not be touched because of booby traps. I had a strange feeling about this room when thinking of the amusement the ops here had given us so far away, and we them, of course.

In passing I was less than amused when emerging from this place to be confronted by a Frenchman armed with sub-machine gun and brassard who threatened to shoot me for looting. These Frenchmen popped up towards the end of the war, and were a constant menace to us for some time until our own people moved in. They had, it seems, learned well from former masters on the ability to shout at the tops of their voices and order anyone in sight to take off. To move after dark, it was most important to be in company and speak at all times or risk a burst of gunfire. Merignac became a large RAF staffing post for aircraft then passing through to the Far East in vast numbers. As many as 40 aircraft a day refuelled and passed on for a very long time until the atom bomb put an end to the need.

Also interesting were the German depth charge dumps near the airfield. These had casings made of concrete (due to shortage of steel in Germany) and were in huge dumps of several hundreds of tonnes. The casings over time developed tiny cracks, and the contents started to leak out (looking like honey). POWs were brought in to remove these and took a lot of persuading to do so, since a slip of one of them would have caused an enormous explosion. However, they were man-handled carefully one at a time, carted down to the port, placed on anything capable of being towed to sea, and there sunk a few miles off the coast. It was considered too risky to touch them again!

Contesting in Turkey - TA5KA

In the December 1991 issue of *Amateur Radio* I briefly mentioned that the CQ Worldwide SSB and CW DX contests, which take place in October and November each year, are a good source of rare DX, and also rich fields for prefix hunters. A strategically chosen location could give the operators a chance to achieve excellent results. There is a small group of people who are very good at both DXing and contesting. Some of the better known Hungarians come into this category.

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A short time ago, I received a letter from Dodi HA6NF, who enclosed a brief description by Gyozo HA0MM about their participation in the 1990 CQ WW SSB and CW contest. The team for the October SSB contest was made up of Zoli HA5PP, Joska HA0LC, Gyozo HA0MM and Jani HA0NNN. They were joined by their Turkish friends Mehmet TA5B and Mehmet TA5C, and the group operated under the callsign of YM5KA in the single-transmitter multi-operator category. The Hungarians travelled by car to Turkey and, after 2500 kilometres, reached their destination at a seaside resort.

A three-element tri-bander beam, specially constructed for this occasion by HA0KLE, proved to be a winner during the contest. Other antennas used were a Butternut HF6V and a variety of dipoles for 80 and 40 metres. The station was staffed by two operators continuously during the whole of the course, and they changed over every four hours. The unique prefix was a blessing in disguise and created quite a demand for a multiplier.

A total of 7609 QSOs were made during the 48-hour period of the SSB contest - 133 countries worked. The team finished up with 15,056,664 points, which was a new Asian record in the multi-operator single-transmitter category, and reached third position world-wide. Both the transmitters and antennas worked very satisfactorily. There were no mishaps other than several interruptions to the outside power supply which, after some investigation, was diagnosed as being a local one in the building where the team stayed.

The November CW section of the contest used the callsign TA5KA and again attracted a good response from the contesting fraternity. There was no more interruption to the power supply because they decided to stay in a different house. The CW contest proved to be a winner for the Hungarians. They made 7201 QSOs on six bands, with a total point-score of 13,915,044, which created a new world record in the multi-operator single-transmitter category.

The TA5KA operators at their QTH in Adana, Turkey.

The YM5KA team with their XYLs (left to right) HA0NNN, XYL-NNN, HA5PP, XYL-PP, XYL-LC, HA0LC, XYL-MM, HA0MM.

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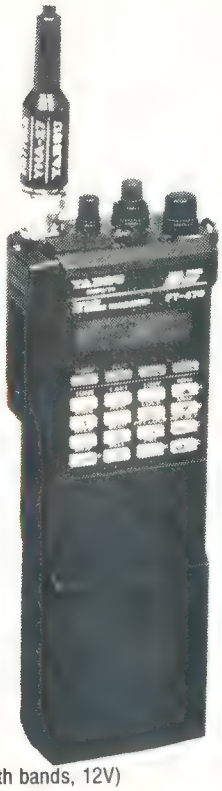

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Cat D-3360

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Just like the FT-1000, Yeasu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be.... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Unique Features

- Customizable RF Speech Processor - Yaesu's unique Frequency Shifted Processor (FSP) lets you shift the IF passband of your transmitted SSB signal to provide maximum punch with your voice/microphone combination.
- Digital Audio Filtering - Razor sharp audio filtering is available for tough SSB and CW reception conditions through the use of an astounding dual digital Switched Capacitance Filter (SCF) with independently adjustable selectivity skirts.
- Packet/RTTY - Separate interface jacks for a RTTY terminal unit and a Packet TNC are provided, while the mode selection buttons disable the mic automatically in the digital modes.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

Convenience Features

- A highly efficient AC switch-mode power supply is built-in. It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
- An in-built Automatic Antenna Tuner with 39 memories is standard!
- Modular construction maximizes selectivity and makes servicing easy.
- Effective interference rejection is facilitated by IF Shift, IF Notch, IF bandwidth and SCF audio controls.
- An adjustable noise blanker, a 500Hz B/W IF crystal filter and a comprehensive, easy to read user manual are also supplied.

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MOBILE ONE

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

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ST-7500 2m/70cm MOBILE ANTENNA

NEW $92

At last, a high performance dualband mobile antenna at a down to earth price. The ST-7500 is just 1metre long and uses a ground independent design to provide high gain (3dB on 2m, 5.5dB on 70cm) with a maximum power rating of 150W. Quality Japanese construction together with a tiltable whip structure make this an ideal antenna for the discerning mobile operator. Requires SO-239 antenna base (D-4035 recommended).

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Cat D-3492

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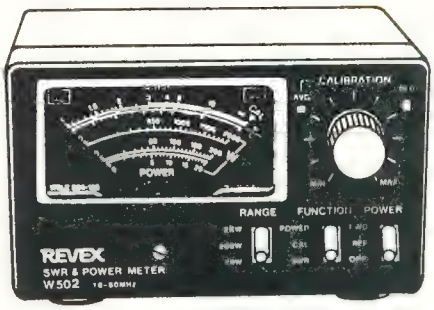

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Awards

John Kelleher VK3DP – Federal Awards Manager

WIA DXCC STANDINGS LIST

as at 7th May 1992

Considerable work has been put into updating and clarifying the WIA DXCC standing list. Old records have been re-examined, a comprehensive card index system introduced, and the standings list entered into a computer database in the Federal Office.

When laboriously going through the records, it was found that many on the list were now deceased, or no longer held that callsign, or had not requested an update for many years. Therefore, in compiling this list, it was decided to only list those amateurs whose callsign was current, and who had either applied for DXCC, or had their standing updated, since 1st January 1985.

If you are not on this list, or your countries total is not what you believe it should be, please write to me with the details. I am determined to get this list correct, and keep it that way, but your assistance is needed.

PHONE

CALLSIGN	COUNTRIES
VK5MS	323/373
VK6RU	322/373
VK4KS	322/364
VK5WO	322/353
VK6LK	322/342
VK5XN	322/338
VK6HD	322/335
VK3AKK	322/330
VK6MK	321/367
VK4LC	321/363
VK3QI	321/330
VK3DYL	320/321
VK4RF	319/335
VK3OT	318/327
VK6NE	315/327
VK3AMK	314/329
VK3YJ	312/314
VK5EE	312/313
VK3CSR	309/313
VK4VC	308/324
VK7LZ	306/326
VK6AJW	306/309
VK3RF	305/311
VK3AWY	305/310
VK3WJ	305/308
VK1ZL	304/305
VK7BC	303/309
VK6HE	303/307
VK4UA	294/308
VK4PX	292/312
VK2AKP	291/294
VK4UC	289/305
VK2APK	287/312
VK4BG	286/299
VK2DTH	286/287
VK7AE	285/291
VK3DU	284/290
VK5OU	283/286
VK4OH	282/283
VK3VU	274/275
VK4DP	271/276
VK2WU	270/272
VK3CYL	267/271
VK3JI	266/279
VK2FGI	263/264
VK6VS	258/259
VK2SG	254/274
VK3GI	254/256
VK2AVZ	251/256
VK3VQ	250/265
VK2BCH	224/226
VK2CKW	224/225
VK5BO	220/222
VK4OX	220/221
VK5IE	220/221
VK2PU	213/214
VK6YF	212/213
VK4KRP	201
VK4OD	200/201
VK5PS	200/201
VK3DP	189/190
VK6BQN	187/190
VK4AIX	183/184
VK3ABO	180/181
VK3EW	171
VK2AAC	164/168
VK2BQS	163
VK3DVT	160/161
VK2DVU	149/150
VK2AGA	132
VK7YP	123/124
VK4ATQ	119
VK2AMV	116/117
VK2CWG	116/117
VK4ADZ	113
VK5GZ	111/020
VK3XV	111
VK5DI	110/111
VK4LV	108/110
VK3DD	108/109
VK3APT	107/108
VK5AGM	106/107
VK4EJ	105/106
VK3EHP	104/105
VK5ZH	103/105
VK4BJE	103/104
VK3YH	103
VK2CMV	101/102
VK1LF	101

CW

VK2QL	313/359	VK4UC	170/178
VK3XB	313/343	VK5BO	160/184
VK6HD	312/329	VK4DA	153/154
VK3QI	311/318	VK4UA	144/177
VK3YL	304/340	VK4AIX	142/143
VK4RF	303/327	VK2SG	137/148
VK3KS	299/322	VK4KS	128/139
VK7LZ	278/313	VK5AGX	118
VK2APK	276/303	VK2AKP	117
VK6RU	275/317	VK5GZ	115/116
VK5QJ	114	VK3JI	285/312
VK1DH	113	VK4DP	284/294
VK2CWS	106/107	VK3DP	276/277
VK4FB	105/106	VK3CYL	267/271
VK4PX	104/112	VK5BO	266/301

OPEN

VK6HD	323/343	VK3VQ	265/280
VK6RU	322/373	VK4OD	255/256
VK4KS	322/364	VK4AIX	203/204
VK5WO	322/356	VK2AAC	176/180
VK3QI	322/332	VK2BQS	173
VK3AKK	322/330	VK4DA	154/155
VK6MK	321/367	VK5GZ	139/140
VK3YL	321/363	VK1DH	133
VK3OT	321/330	VK5AGX	133
VK4RF	319/352	VK6NV	127/128
VK3JA	314/359	VK2AMV	120/121
VK3AMK	314/329	VK5AOL	105/106
VK7BC	313/318	VK6ASO	104
VK7LZ	308/345	VK3COR	103/104
VK3XB	303/340	VK2KE	100
VK4PX	299/323	VK5ZN	100
VK4UA	298/310	VK2PA	099/112
VK2APK	294/328	**CW**	
VK4BG	293/309	VK2SG	159/160
VK2SG	292/314	VK2BQS	109/110
VK4UC	291/309	VK3EBP	105/106
VK2AKP	291/294	VK5RY	101/102

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Contests

Australasian Sprints CW and Phone, July 1992

The Adelaide Hills Amateur Radio Society Inc is pleased to announce that the seventh series of the annual Australasian Sprints will be held during July 1992.

Both of these contests, which are for CW and phone operators respectively, and are of one-hour duration on 80 metres, are open to all appropriately licensed amateurs in VK, ZL and P2 call areas. As in past contests, a section is provided for SWLs.

The Australasian Sprints are endorsed and co-sponsored by the South Australian/Northern Territory Division of the Wireless Institute of Australia and the Adelaide Hills Amateur Radio Society, and certificates and trophies will be awarded to call area winners and overall winners. Also, a certificate will be awarded to the highest scoring novice class operator in the CW sprint only, provided this entrant is not entitled to another award for the CW sprint.

The reasoning behind the concept of the Australasian Sprints is simple. Most contests are long with fairly complex rules, and participation - except by serious contesters - is tending to diminish. The Australasian Sprints, being of only one-hour duration, are quick and simple, challenging but fun.

Object of the sprints

The operator's basic goal in the sprints is to make (and SWLs to hear and log) as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with a VK, ZL or P2 station on 80 metres during the contest period can be counted, but a station may be claimed only once.

Eligibility: The Australasian Sprints are open to all licensed amateurs, or groups of amateurs, using a single callsign, eg club stations, anywhere in the VK, ZL and P2 call areas.

Contest period: 1200 to 1300 UTC, 4 July 1992 (CW only)

1200 to 1300 UTC, 11 July 1992 (phone only, any legal mode)

Frequencies: For the CW sprint, frequencies between 3.500 and 3.700MHz may be used.

For the phone sprint, frequencies between 3.535 and 3.700MHz may be used.

Contest call: CQ Sprint or CQ Test or CQ Contest.

Exchanges: Minimum exchange for a valid contact will consist of a signal report and a three-digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached.

Logs: Contest logs must show for each contact the time (UTC), callsign of station worked (both callsigns for SWLs), report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the name and date of the sprint (CW or phone), the total number of contacts claimed and a statement that the operator(s) has abided by the rules and spirit of the contest. This cover sheet is to be signed by the operator(s) and personal callsigns added

where multi-operators enter using a club callsign. Any special conditions such as QRP or mobile operation should be mentioned in the statement. Any comments you wish to make will be welcomed by the sponsors.

Logs are to be in the hands of the AHARS, PO Box 401, Blackwood SA 5051, Attention: Contest Manager, no later than Friday 14 August, and the envelope is to be endorsed CW, phone or SWL Sprint.

Awards: Certificates will be awarded to the highest score in each VK, ZL and P2 call area for both the CW and phone sprints. Trophies will be awarded to the outright winners of both. A certificate will also be awarded to the highest scoring novice class operator in the CW sprint only, provided this entrant is not entitled to another award for the CW sprint. Certificates may be awarded to other operators whose performance was, in the opinion of the sponsors, exemplary.

SWLs: Certificates will be awarded to the highest scoring listener log in the VK, ZL and P2 call areas for both the CW and phone sprints.

Any entry which is clearly in violation of the rules or spirit of this contest, or which contains an excessive number of duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed) may be disqualified. The decision of the Adelaide Hills Amateur Radio Society Inc in respect of the interpretation of these rules, the granting of awards and disqualification will be final.

These contests are recommended as a good Saturday evening entertainment. If you have never entered a contest before, here is a good, friendly time to start. Join in and enjoy the fun.

UHF/VHF Field Day: Correction

I wish to apologise for an error in the results for this contest published in April *AR*. VK5BW should have been listed as a multi-operator station, the operators being Alan Raftery VK5BW, Andrew Russell VK5ZUC and Tony Denton.

With a score of 12591 points, VK5BW therefore scores first place in the multi-operator section, rather than second place in the single-operator section. My condolences to the Geelong ARC team, and congratulations to the operators of VK5BW.

John Martin VK3ZJC

VK Novice Contest 1992 Rules

Contest Period

From 0800 UTC 20 June 1992 until 0800 UTC 21 June 1992

Objects of the Contest

To encourage participation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with novice and radio club stations.

Stations Eligible

Only stations in VK, ZL and P2 call areas may enter. No stations outside these call areas are permitted to be worked or entered in a log for the purpose of this contest. Except for club stations, no multi-operator working is allowed. Stations in the same call area may contact each other as well as stations in other call areas.

Contest Bands

All operations must be confined to within the novice frequency sub-band allocations in the 10, 15 and 80m bands. No cross-band operation is permitted. Novice allocation VK HF 3.525-3.625MHz, 21.125-21.200MHz and 28.100-28.600MHz.

Modes of Operation

Section (a) phone - novice/full call

Section (b) CW - novice/full call

Section (c) SWL

Scoring

For contacts with a novice station - five (5) points

For contact with a club station - ten (10) points

For contact with a full call station - two (2) points

Listener Section

For novice to novice contacts - five (5) points

For novice to full call stations - two (2) points

For full call to full call stations - two (2) points

For any contact with a radio club - ten (1) points

A listener (SWL entry may log only ten (1) sequential contacts made by a station, and then must log no less than another five (5) stations before logging that station again. The five (5) stations so logged need a minimum of one contact only logged.

For phone stations, call CQ Novice Contest.

For CW stations, call CQ N.

Contacts

Any station may be contacted **twice** per band, provided a period of at least 12 hours has passed after the first contact.

Number Exchange

Section (a), on phone. Stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence at 001 for the first contact and increase by one for each further contact.

Section (b), for CW stations. As for phone, but the report is an RST followed by the serial number.

Log Entries

Each log should be laid out so as to provide columns in the order given as follows:

Date/time UTC. Band. Mode. Station contacted. Report and serial number sent.

Report and serial number received. Claimed score. Each log sheet must be endorsed at the top "VK Novice Contest 1992".

Total claimed score for each page must be shown on the bottom of the page.

Front Sheet

A front sheet must be attached to the contest log and must carry the following information:

Name and address of operator. Callsign. Station location. Section entered. Score. Declaration. The front sheet must also carry a declaration which states: I hereby certify that I have operated within the terms of my licence, and the rules and spirit of the contest. This declaration must be followed by the signature of the operator, with date. In the case of a club station, the entry must be signed by a responsible officer of the club committee, or a licensed operator delegated by the committee to do so. In the case of multi-operator stations, the callsigns of participating operators must also be shown on the front sheet.

Regulations

All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Entries To

Entries must be posted so as to reach the Contest Manager no later than 24 July 1992. The address for entries is: Novice Contests Manager, WARC, Box 1, Teralba 2284.

Certificates

Certificates will be awarded to the top scoring stations in each section at the discretion of the Federal Contest Manager.

Certificates will also be awarded to the top scoring novice stations in each call area and and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophies

The Keith Howard VK2AKX Trophy for the novice entrant with the highest aggregate (phone and CW) score, and the Clive Burns Memorial Trophy for the novice entrant with the highest CW score, are perpetual trophies on permanent display at the Executive Office. In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition.

Provision is made for adjudication in the case of a tie.

Operator

A person may submit only one contest log per mode.

Logs for entries where an operator uses more than one callsign whilst operating in this contest will not be accepted.

Disqualification

The contest disqualification criteria as published annually in *Amateur Radio* will apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics may also be disqualified.

Ken Miller VK2GKM

Novice Contest Co-ordinator

The Sunshine State Jack Files Memorial Contest 1992

Objects

1. The objects of the Contest are to:
   a. perpetuate the memory of the late Jack Files, a long-time member of the Council of the Queensland Division of the Wireless Institute of Australia;
   b. enable amateur radio operators to work Queensland stations for the Worked All Queensland Award, and other awards issued by radio clubs in Queensland;
   c. encourage mobile/portable operation from the lesser populated towns and shires in Queensland;
   d. provide a "warm-up run" for the Remembrance Day Contest.

Period

2. The contest will be run over the six hours between 0700hrs UTC (1700hrs EAST) and 1259hrs UTC (2259hrs EAST) on 18 July 1992.

Sections

3. Stations within VK4:
   a. Tx all band. Twenty percent of contacts claimed must have been made on the V/UHF bands;
   b. Tx HF phone;
   c. TX HF CW;
   d. Tx V/UHF only;
   e. club stations in a to d above, single transmitter;
   f. mobile/portable stations in a to e above.
4. Stations outside VK4:
   a. Tx all band phone;
   b. Tx all band CW.

Preferred Contest Frequencies

Phone			CW		
1.820	-	1.840MHz	1.805	-	1.815MHz
3.570	-	3.590MHz	3.525	-	3.535MHz
7.100	-	7.120MHz	7.010	-	7.020MHz
14.180	-	14.200MHz	14.050	-	14.060MHz
21.170	-	21.195MHz	21.125	-	21.150MHz
28.480	-	28.520MHz	28.125	-	28.125MHz

Operation

5. The WARC bands may not be used in this contest. Cross-band operation is permitted only via a satellite repeater; contacts made via a net are not admissible; cross-mode operation is allowed.
6. The contest is primarily for single-operator stations, but log keepers are allowed. Where two licensees use a single station, each is to submit a separate log.
7. Club stations may use multiple operators, provided there is only one transmitter in use at any one time.
8. Home-based stations may be worked again after an elapsed time of one (1) hour.
9. Mobile or portable stations are not subject to the one-hour rule when operating from a different city/town/shire. When operating within one hour from that of previous operations, they are regarded as "new" stations for their own and the contacted stations' scoring purposes. (Different is not to be taken as alternating, eg operations from Area A for 50 minutes, then move to Area B, operate for 50 minutes and return to Area A, would be regarded as alternating, not different). Operations from the same city/town/shire after one hour, regardless of movement within that area, are regarded as home-station operations.

Calling Procedure

10. Phone: CQ Jack Files Contest
    CW: CQ Test Jack Files.

Exchanges

11. Each exchange is to contain the following elements:
    a. the location designator, N or S, see **scoring;**
    b. the serial number beginning with 001 and continuing in sequence throughout the contest and on all bands worked;
    c. the "code letters" of the designated city/town/shire as set out in the attached "Designated Areas and Code Letters".

Scoring

12. For scoring purposes Queensland is divided into two zones by the Tropic of Capricorn. Stations in designated areas north of the Tropic are to use the letter "N" as the first element of contact exchange. Those in designated areas south of the Tropic are to use "S" similarly.
Example: A valid exchange for scoring purposes might be:

S	001	MH
Zone	Contact	City/town/shire
N	132	RH

13. Stations within VK4, phone contacts:
    a. HF/V/U/HF within the same zone 3 points
    b. HF/V/U/HF with the opposite zone 5 points
    c. HF/V/U/HF outside VK4 2 points
    d. ALL CW contacts score double points, ie 6, 10 or 4.
14. Stations outside VK4, **all** phone contacts, two points, **all** CW contacts, four points.

Bonus Points Applicable to all Stations

15. A bonus of ten (10) points may be claimed for the *first* contact with a city/town/shire, other than the one from which the claimant is operating, over the whole contest.
16. A further bonus of ten (10) points may be claimed for each club station on *each occasion* it is worked (one-hour rule still applies).
Examples - **Phone:** A VK4 station in S zone, first contact with VK4000 in Cairns, which is the club station of the Green Island ARC Inc, ... score five points for across zone, 10 points for first contact Cairns City, 10 points for club station; total 25 points.
CW: For the same contact, score 10, 10, 10; total 30 points.
Stations outside VK4 would score 2, 10, 10, or 4, 10, 10 for phone or CW respectively.
NB: No further bonus may be claimed for Cairns City.

Logs

17. Logs must show the full name, address and callsign of the operator(s), the section entered, points claimed for each contact and the total points claimed; a signed and dated statement that the rules have been followed, and the appropriate licence conditions observed. A recommended form of log is:
(Assumes VK4SSS is not a club station)

Date	Band	Mode	Call	No	No		Points		
Time				Sent	Recd	QSO	C/T/S	Club	To
15/7/92									
0834	7.0MHz	Phone	VK4000	S001BE	N002CS	5	10	10	2
0837	7.0MHz	Phone	VK4SSS	S002BE	S001BE	3			

18. Logs are to arrive at:
VK4 Contest Manager
T Mulholland VK4AEM
PO Box 35
CALOUNDRA 4551
On or **before** 14 August 1992.

Awards

19. Trophies will be awarded by the VK4 Awards manager to the highest scorer in each section, provided there is a minimum of five entries in that section.

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Code to Define Cities, Towns and Shires for the Jack Files Contest

CITIES/TOWNS							
Brisbane	BN	Barcoo	BO	Etheridge	ET	Mundubbera	MU
Bundaberg	BU	Bauhinnia	BH	Fitzroy	FZ	Murgon	MY
Cairns	CS	Beaudesert	BT	Flinders	FL	Murella	MX
Caloundra	CA	Belyando	BY	Gatton	GT	Murweh	MH
Charters Towers	CT	Bendemere	BD	Gayndah	GH	Nanango	NN
Dalby	DY	Biggenden	BG	Glengallan	GL	Nebo	NE
Gladstone	GD	Blackall	BX	Gooboorum	GM	Noosa	NO
Gold Coast	GC	Boonah	BV	Herberton	HT	Paroo	PO
Goondiwindi	GI	Booringah	BQ	Hinchinbrook	HK	Peak Downs	PD
Gympie	GY	Boulia	BZ	Ilfracombe	IL	Perry	PY
Hervey Bay	HB	Bowen	BW	Inglewood	IW	Pine Rivers	PR
Ipswich	IP	Broadsound	BS	Isis	IS	Pioneer	PI
Logan City	LC	Bulloo	BP	Isisford	IF	Pittsworth	PT
Mackay	MC	Bungil	BI	Jericho	JE	Proserpine	PP
Maryborough	MB	Burke	BR	Johnstone	JO	Quilpie	QL
Mount Isa	MI	Caboolture	CB	Jondaryan	JY	Redland	RD
Redcliff	RC	Calliope	CL	Kilcoy	KY	Richmond	RI
Rockhampton	RH	Cambooya	CM	Kilkivan	KK	Rosalie	RO
Roma	RM	Cardwell	CD	Kingaroy	KG	Rosenthal	RL
Toowoomba	TO	Carpentaria	CP	Kolan	KO	Sarina	SA
Townsville	TV	Chinchilla	CH	Laidley	LA	Stanthorpe	ST
Thuringowa	TH	Clifton	CF	Livingston	LV	Tambo	TB
Warwick	WA	Clonclurry	CY	Longreach	LO	Tara	TA
		Cook	CK	McKinlay	MK	Taroom	TM
Shires		Crows Nest	CN	Mareeba	MA	Tiaro	TI
Albert	AL	Croydon	CR	Maroochy	MO	Torres	TE
Allora	AA	Dalrymple	DL	Milmeran	ML	Waggamba	WG
Aramac	AC	Diamantina	DI	Mirani	MN	Wambo	WO
Arakun*	AN	Douglas	DG	Miriam Vale	MV	Waroo	WR
Atherton	AT	Duaringa	DU	Monto	MT	Widgee	WE
Burdekin	BK	Eacham	EA	Moreton	MR	Winton	WI
Balonne	BL	Eidsvole	ED	Mornington*	MZ	Wondai	WD
Banana	BA	Emerald	EM	Mount Mogan	MM	Woocoo	WC
Barcaldine	BC	Esk	EK	Mulgrave	MG	Woongarra	WN

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VHF/UHF – An Expanding World

Eric Jamieson VK5LP – PO Box 169 Meningie 5264

All times are UTC
Beacon Notes
50.006 PJ2/OH1ZAA is a new CW beacon from Curacao, Netherland Antilles.

Six Metres in Australia

Some late items were missed last month with the deadline for copy being a week earlier than usual, but they have been included this month.

Following the working of 3D2AG on Rotuma Island on 26/3 (reported last month) Antoine has been a regular signal to Australia and as far as VK5 on 27, 28, 29/3; 1, 3, 4, 9, 10, 12, 15, 18, 20, 22 and 25/4 at least. On most occasions he has been accompanied by Ian 3D2PO from Fiji, both with signals to 5x9. On 27/3 JAs were in for most of the day, at 2230 3D2AG to VK5BC, RO, LP, ZDR, EOT and other VK3s, VK2FLR and others, all heard here on backscatter. 31/3: VK5RO at 2309 worked XE3EB at 5x5.

On 1/4 at 2315 XE3EB 5x4, also to VK5BC, 3D2AG to VK2, 3, 4, 5 at 5x9 with his 100 watts and four-element beam; 2/4: 1100 VK6PA and VK6JQ worked 9K2ZR, probably first VKs to work the Kuwait station. 3/4: 2340 KG6DX, KG6UH/DU1 and b/s to VK2, 3, 4. On 4/4 at 0005 KG6UH/DU1, 0015 VK8ZLX and VK8RH in conversation, both sides audible here, many JAs. At 0215 VK5BC calling HK0/W6KV, 2330 VK4ZJB worked HK0/W6KV, also CN8ST the day before. 5/4: VK3OT worked the HK0 at 2330 but only in here for about 30 seconds.

7/4: 0945 VK6RO and VK6HK worked 9K2ZR; 9/4 VK5BC and VK5NY were working John VK4KK at 0200 but no sign of John here - that's Es for you. At 0430 there was a mass of signals between 38 and 50MHz plus JAs, who this day had worked VK1, 2, 3, 4, 5, 8 and ZL. Enormous amount of crud on 50MHz from 49.750 video, culminating in the reception of Chinese TV by VK3OT and VK5LP around 0730. At this time there were no signals below 46.8, but plenty right up to 56MHz, including JAs on 52MHz. At 0819 JAs worked V73AT. At 2204 HK0/W6KV was worked by VKs 5O, 5BC, 5ZDR and VK3OT at 5x9.

15/4 was another good day, many JAs, 1057 VK6PA heard here for the first time, 2330 to 2355 3D2AG and 3D2PO worked VK1, 2, 3, 5 and 7, with both reaching 5x9+20 here. 16/4: 0047 V73AT 439. Ws to VK3OT. 18/4: 0004 XE1GE to VK5NY, XE1GRR noted on 50.110 working another talking in Spanish, but unable to break in. 20/4: 0350 Mike EK0JA working split frequency to VK8ZLD. At 0400 UZ0CWW also split to VK4KK, VK4APG, VK4ZAA and probably others in VK4, also VK3OT, VK8ZLX - so at last eastern Siberia available. 2/64: VK3OT worked 7Q7XX at 1000, which was a good catch. Heard that VK2MQ had worked Chep PJ9EE.

VK5RO Report

VK5 generally has to struggle to some extent when it comes to sharing much of the DX. However, Col VK5RO reports as follows: 1/4: 2310 XE1GE, 2320 3D2PO, 3D2AG, 2342 called a 9Y? but no contact. 6/4: 2340 W5FF, 2345 heard HK0AR and HK0/W6JKV working to VK and ZL, 0630 to 0905 JAs, 2158 worked HK0/W6JKV at 559 but peaking to S9 at 2204. 10/4: 1321 JA7WSZ, 1325 VS6BG, 1330 V85PB. 15/4: 0723 JA2BZY, 2341 3D2AG, 3D2PO. 16/4: 0001 K6FV 5x5, 0009 N6AMG. 17/4: 2324 XE1GE, 2327 WA4LOX, 2333 W4IXH, 2342 heard Rudi CX2PI. 21/4: 2252 C6ANY heard working VK2QF, then calling CQ, but no takers. 22/4: 2343 3D2AG. 25/4: 2324 3D2AG. 26/4: 0019 XE1GRR, 0024 XE1GE, 0823 to 1004 JAs. Interesting to note the consistent signals from 3D2 and XE, similar situation at VK5LP.

VK7ZMF Report

I was particularly pleased to receive a report from Frank VK7ZMF on the state of six metres from the Tasmanian viewpoint - news from there is usually rather scarce! Frank operates from Arthurs Lake at an altitude of 1061 metres (3500 feet) and runs 80 watts to a 10-element Yagi with a 14m (45ft) boom and 10 metres high.

19/3: C21BR. 24/3: T3OJH, VK8ZLX, 3D2AG. 26/3: 3D2AG. 27/3: C21BR. 31/3: 3D2AG, VK4TJA. 2/4: 3D2PO, 3D2AG, XE2HWB. 6/4: 3D2AG. 13/4: W5OZI, ZL3TY. 15/4: ZLs, 3D2PO, VK4s. 21/4: XE1GRR, K6FV, WB6BYA, K6QXY, UZ0CWW. 23/4: N6XQ. All contacts were SSB and S2 to S9. Quite a good effort for a little over a month.

Frank adds some comments on a matter which has also been of concern to me for some time and reported in my notes. I think I should quote him - *Some of the contacts I hear organised on 28.885MHz are highly suspect. I have heard many exchanges of signal reports and callsigns, grid locators etc. They go to a 50MHz frequency and, it seems, if they hear a noise (any noise), that seems to be regarded as a contact with the details passed over on 10 metres. Recently I heard signal reports passed to a station who replied he wasn't transmitting, but that didn't appear to affect the results; eg, a two-way contact on six! These contacts are very annoying to the people who have genuine contacts and put a lot of time and effort into the band. That's enough of my whinge, at least I know none of my contacts is a ghost!*

The above problem may not be widespread, but it is a pity that it should appear to be occurring at all, and also it is not only confined to VK.

Bulletin Board Information

Courtesy of VK5ZBK, the following received via BBS - 2/4: YC0UVO and YB0USJ at 1515 worked VQ9JT, QSL via K5DIY or VQ9 bureau; 1522: 9K2ZR, QSL via K8EFS; 1553: 4S7/JA1OEM, QSL via home call. 6/4: HL9TG advises from square PM36MX that his 6m gear has been re-activated - first day 27/3 resulted in a good opening to VK and P29 using 10 watts and a five-element 10m monoband Yagi with a VHF tuner! He says there are many 6m rigs in Korea, but most do not take the band seriously and use it as a local "intercom". He says to check 52MHz FM as that is a known "in country" intercom frequency. 7/4: Special call - ZS7OSAN 50.120 SSB, QSL via buro or ZS7OSAN, Box 14, Honeydew, 2040, South Africa.

Presenting the VK6PA Saga

A massive report of stations worked has arrived from Steve VK6PA at Karratha, and I have tried to present it in a concise manner as I think the information should be included in the columns, at least for posterity. It also indicates what an incredible location he lives in, especially for contacts to Europe; a good percentage of those shown have been made using SSB and with many signals 5x9 both ways and some stations have been using no more than 10 watts. By comparison, most of us further east really only pick up the crumbs!

28/1: 1108 to 1236 - DJ1, F6, DK5, F1, DJ2, PA2, LX1, PA0, ON1, G7, FC1, PE1, G3, SM7, G4, SM6, GI0, OZ1, SK7, PA3, G4, ON4, F6, JA5, 24 call areas for a total of 44 contacts in 11 countries, most on SSB and many at S9.

29/1: 1114 to 1330 - ON4, G7, G3, GJ4, OZ1, GW3, G4, PA0, F1, G6, OK1, DL8, ES5, SM6, DF9, G1, SM7, OZ7, DL6, OH2, PE1, DJ4, DL1, DL9, DK6, PA3, JH4, 24 call areas for 34 contacts in 13 countries.

5/2: 1215 to 1238 - G8, GM0, G3, ON4, PE1, G6, PL1, F1, eight call areas for 12 contacts in five countries.

6/2 to 12/2: F5, JA2, JA1, VS6, G3, DJ8, PA0, G8, ON1, AH6.

14/2: 0805 to 1357 - YU3, YU2, IV3, YO3, I2, G8, SM7, OZ1, G1, PE1, G3, PA0, ON4, PA3, OZ4, GJ4, F6, DJ9, OZ6, G4, SM1, DL8, DL6, OZ8, OZ5, G6, PA2, OZ1, DK7, FC1, LA9, OK1, LA1, F1, DK2, PA2, DJ1, SM6, OE5, G7, DL7, ON7, DJ9, F8, HL1 and 16 JAs, 51 call areas for 106 contacts in 16 countries.

15/2: 0836 to 1436 - IK2, YU2, YU3, YO2, YT3, OK2, G3, IK4, DK8, PA2, FC1, DK6, I2, DF5, DJ8, I5, G1, PA3, DJ2, G6, OZ1, OZ3, SM7, DJ9, PA0, G4, GW2, PE1, G0, DL3, OE4, PB0, IK1, ES6, GI0, SM1, ON1, SM6, LA9, I0, ON4, ES5, OG2, SM3, OZ5, OH1, LA2, DF7, OZ2, OH3, SM0, OH2, DK2, OH3, ON7, OH5, LA8, OZ4, DK6, OK1, G4, SM5, G7, F5, IK0, DJ6, ES0, OE5, DL4, OE6, CT1, F6, F8, I5, DL8, DL9, JA6, JA7, JE3, 79 call areas for 156 contacts in 19 countries.

16/2: 0811 to 1152 - DF7, OK2, OE5, OK1, ES5, LA3, OZ2, FC1, DK8, SM7, OK3, IK2, OZ1, DK7, YU2, ES6, IK1, SM6, LX1, SM0, OZ5, YU3, SM6, OZ7, OZ3, ON4, DJ4, JE3, G4, OE6, P31, PA3, I4, FD1, DK1, IV3, DL3, LA3, LA6, I5, DL6, OZ6, SM3, DL8, OZ1, F6, G3, G8, G1, DF6, OH1, G0, G7, DF4, OZ9, GJ4, GM3, 57 call areas for 128 contacts in 20 countries.

17/2: 1050 to 1113 - DL8, PA2, DK2, LA9, DJ3, OZ1, DJ4, PA3, DL1, DL2, PE1, PA0, DL9, G1, DJ6, DL5, OZ8, OZ4, GI0, OZ7, OH7, G3, F1, G8, OH3, GM6, LA5, OH2, G0, G7, DJ5, OZ3, SM5, DF8, OZ6, GW6, 36 call areas for 43 contacts in 12 countries.

18/2: 0829 to 1227 - PA2, OH3, OH2, ES5, OH1, OZ8, SM7, OZ7, PA0, GJ0, SM6, FC1, G3, SM0, JA4, JA3, JR6, DK8, DL6, SK0, ON1, ON5, DL9, PA3, DJ4, G0, OZ2, OZ6, DL8, PE1, DL1, DK7, SM7, OZ1, G7, DK9, G6, DF9, G8, DK3, OZ1, G2, OZ9, F6, JF6, DF8, G5, ON3, 48 call areas for 93 contacts in 12 countries.

19/2: 0800 to 1249 - DJ1, YU3, FC1, OE4, OE5, IK1, DK2, DK8, DL7, OZ8, G3, PA0, PA3, G7, G4, PE1, G0, G2, DF7, JN6, F6, JA7, JA4, 23 call areas for 33 contacts in nine countries.

20/2: 1206 to 1310 - LA9, SM6, G3, G4, OK1, GW2, DL8, SM7, PA0, G6, PA3, G7, DJ1, G8, JE6, JH3, OE5, ON4, OZ2, OZ4, 21 call areas for 25 contacts in 13 countries.

22/2: 1058 to 1141 - ON4, PA3, JA2, J36, F5. Must have been a poor day!

23/2: 0957 to 1152 - G8, G7, G3, G1, G4, G6, G0, GB5, JH1, 9H1, 5B4, JA5, SV1, CT1, GI1, GI4, GM4, GI7, GI8, PE1, G0, PA3, DF5, 23 call areas for 52 contacts in 10 countries.

After 23/2 the contacts tapered off, 1/3 producing contacts to K2, FC1, FD1, F1, F6, CT1. 5/3: KC6/WORRY. 6/3: KC6RR, JA7, JH1, JD1, JR2, VS6, JK1. 7/3: JR7, KC6RR, JH6, VK8ZMA, VK8KDR, VK8RH, 7K1, JD1, VS6XMQ, KG6UY/DU1. 22/3: V73AT, SV1UN, 9H1BT, JA8, JG4, JA5, JQ2, JE3, heard JT1CO. 23/3: JA6, SV1UN, KG6UH/DU1. 24/3: NI6E/KH6, 3D2AG, VK4s, SV1UN, 9H1BT, JN1. 26/3: VK5RO, NI6E/KH6, PY0FF, V73AT/B, DX1HB/B, JH1MAO/JD1, JAs, KG6UH/DU1, VK9CK. 27/3: JAs, HL9TG, VS6SIX/B, KH6, HL1JV.

2/4: 9K2ZR, P29CW, VK4JH, JAs. 3/4: 9K2ZR, VS6WV. 4/4: KG6DX, 3D2AG, VK4s, VK2s, VK3DUT, KH6s, 4S7/JE1OEM, SV1UN. 5/4: 4S7/J31OEM, 9K2ZR, 7K2AZA, VS6XMQ. 7/4: KG6UH/DU1, NI6E/KH6. End of information.

It is of interest to note that at times Steve was making five and six contacts per minute, many times four to the minute - it would be hard to do better under HF contest conditions. With stations appearing at that rate, one wonders how he ever found a clear spot at the other end! We talk of wall-to-wall JAs at times; Steve must have had Europeans in the same manner.

Steve VK6PA appears to have had his first 6m DX contact on 2/4/90 with VS6XMQ, he then got into the act properly on 1/3/91 and, in 13 months since then, has worked 57 countries and appears to need only Africa for WAC. Between 27/1/92 and 4/4/92 he has worked 46 countries. They are: VK, JA, DF, F, PA, LX, ON, G, SM, GI, OZ, GJ, GW, OK, ES, OH, GM, VS6, AH6, YU, IV, YO, LA, OE, HL, CT, 9H1, 5B4, SV, HB9, KC6, JD1, DU1, V85, BT, KG6, V73, JT1/B, 3D2, PJ2/B, PY0, VK9CK, JD, 9K2, P29 and 4S7. Any challengers for a better score in 1992?

The UK Report

From Ted G4UPS and Geoff GJ4ICD: Jean F6IXI was active as TM6CHU, from Chausey Island - locator IN98CU - to early March. QSL to Jean Claude Bernard, 2 Chemin d une Ruelle A L Autre, F-95300 Pontoise, France.

QSL for Bob 9K2ZR is via K8EFS and for 9K2WR via his XYL N6UXB. **Germany:** Six hundred 6m permits have been issued to German amateurs with 50.080 to 50.400 allocated. Power limit is 25 watts to a horizontal antenna. **Lesotho:** Ray 7P8SR is active from square KG31 - QSL to Ray Schenkweiler, PO Box 333, Maseru 100, Lesotho. **Diego Garcia:** Jason VQ9JY in MI70 commenced operating on 24/3. QSL via his home call of KB7CDA. **Vladivostock area:** Information from Kan JA1BK reveals that Mike EK0JA is likely to be found around 2000-2200 on a Saturday morning when the local TV station is off the air for eight to 10 hours. (This would indicate monthly from 18/4 onwards, being the time he and UZ0CWW were first worked in VK ... 5LP).

Between 8/3 and 30/3 African stations were flooding into the UK and Europe - just like the JAs do to VK. Stations heard/worked included ZS6AUI, ZS6JON, ZS2SIX, ZS6XJ, ZS6AWP, ZS6WB, ZS6AXT, V51VHF, 7Q7RM, ZS6YN, ZS6AYE, ZS9A, A22BW, TU20J, VQ9JY, ZS4S, TU4DH, ZR1WDK, ZR1L, V51DM keyer. Others around were FR5SIX, FR5DN, 4S7AVR, TR8CA, 8Q7HP, 7Q7XX, SV1DH, TM6CHU.

Geoff GJ4ICD says F1JKK will operate as TA9/F1JKK from Turkey on 50MHz until about July; QSLs via F6FNU. During November F1JKK will operate from XU. Both could be good contacts for VK stations.

From the above it is obvious there are many South African stations operating, plus a few other exotic call areas from Africa. It seems there are still countries for VK stations to work.

The Higher Bands

Ron VK3AFW sends a lengthy report on band activity on 144, 432 and 1296MHz for the past four months. This indicates a reasonable degree of activity between VK3 and VK1, 2, 5 and 7. These are the highlights. Ron had his first QSO on 1296MHz when he worked Gil VK3AUI on 31/12/91. His rig was the VK5 kit, and running 100mW to a 24-element DL6WU Yagi.

On 12/1/92 he went portable on Mount Buller for the VHF Field Day and worked VK1, 2, 3, 5 and 7 on 144 and 432. On 1296 he heard VK3BBB, VK1BG, VK3KKW/P and worked VK3ELV. On 26/1 VK1BG reported working VK2BKS at Young and VK2BE in Sydney on

1296. 27/1: Arie VK3AMZ copies NDB from Longreach on Es, but unable to raise any VK4 2m stations.

3/2: Plenty of auroral activity on 144. Ron worked VK3YJR, VK3HQ, VK5NC, VK3ELV, VK7XR and VK7ZJG. Another aurora on 10/2 when VK7XR copies VK2RSY and VK5VF beacons on 144, but no contacts made. 26/2: David VK3AUU copied VK5VF and VK6RTW beacons via tropo on 144.

7/3: Special trip to Mount Buller by VK3AFW, now with six watts on 1296, in an effort to work for the first time from VK3 to VK1. Conditions were appalling - could not trigger the Mount Ginini Canberra 2m repeater! Nothing on 432 or 1296!

Ron tried again on 13/3 and worked VK2BFK/P and VK2WG/P on 144. On 1296 he worked VK3AMZ and then VK1DO/1ACA/P on 1296 tropo for the first VK3 to VK1 contact on that band. John VK3ZJF copied VK2BE on 1296. On 21/3 from Mount Buller VK3AFW worked VK1BG on 1296 during the period 2215 to 2245 which gave him the first VK3/P to VK1 home station on 1296. VK2BE in Sydney was also copied. John VK3ZJC was reported working VK2BE on 1296 2 x CW for the first VK3/VK2 contact on 1296. On 24/3 Ian VK1BG worked John VK3ZJF on 1296 at 1115 for the first home station to home station contact on that band, 519 both ways and using aircraft enhancement. 31/3: On 1296 SSB VK1BG worked VK3AMZ and VK3ZJC worked Eddie VK1VP at 5x8, both contacts via aircraft. Well done to all concerned. These are all good contacts mentioned in this paragraph; it seems a pity they lack UTC time, distance, locations and often signal reports, as they are worth recording for the future.

Six Metres Standings List

Those operators wishing to upgrade or add to their lists should have their information on my desk by 25 June, please - in time for the August issue. New entries are always welcome.

Closure

Space is a bit scarce this month, so will close now with two thoughts for the month: *The family fireside is the best of schools* and *A man begins cutting his wisdom teeth the first time he bites off more than he can chew!* 73 from The Voice by the Lake.

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Sign up a new WIA member today - use the form on the reverse of the AR address flysheet.

Pounding Brass

Gilbert Griffith VK3CQ – 7 Church St Bright 3741

"While browsing through the local newsagency the other day I came across a paperback book by Hugh Atkinson called *The Longest Wire,* so I bought it. The story is mainly a drama, but is based on the building of the overland telegraph between Adelaide and Darwin and is set in the early 1870s. I was a little disappointed that there was little or no reference to Morse Code as such, but it was a good yarn all the same. The many pitfalls encountered will amaze you."

I found the above in my notes for March 1989 and began wondering if anyone out there managed to get hold of a copy of *The Longest Wire.*

The ABC national radio station recently ran a radio play version of this story, which some of you may have heard. I seem to recall it was on a program called *Songs and Stories of Australia,* which is on ABC FM each Friday at 11.30am. You will no doubt remember it mainly for the songs done in "country ballad" style. To cut a long story short (if you think this is boring reading it for the first time, how do you think it is for me ... who knew about it before I wrote it down) I have sent off a letter to David Mulhallen to see if he will send me a tape of the play, and whether ABC can run it again. So keep watching and I will let you know if and when it will be on.

Conversely, if you happen across anything interesting, please let me (us) know.

Back in January you will remember I featured some excerpts from the Marconi School of Wireless pamphlet. In the pamphlet the space between words was given as "five dits". This prompted a couple of fast responses to tell us all that the space between words should be seven dits. What I would like to bring to your attention is the small fact that the article was taken from a teaching sheet which was written in the early 1930s, as well as being a "telegraph" teaching sheet. And, if we are going to haggle over two dits out of five or even two dits out of seven when hardly anybody could tell the difference in practice, then try the following on for size. It is taken from an article by Bill Welsh W2DDB, in *CQ* magazine, August 1979.

Dit-to-Dah Relationship

"The dah is generally said to be three times as long as the dit.

"This relationship holds true only at about 15wpm. The length of the dit is constant; it is the time required to lift the wrist after depressing it to send the dit. Since it takes about the same length of time to depress or raise the wrist, the spaces between dits and dahs in a symbol are about a dit length. At a code speed of about 2wpm the dah is commonly about six times the length of a dit, and it shortens to about five times the dit length at 5wpm. The dah length is reduced to about four times the dit length at 9wpm, and is about three times the dit length at 15wpm. The dah is about twice as long as the dit at 35wpm, and is reduced to about 1.5 times the dit length at 55wpm.

"The dit length does not vary in good code, nor does the space between dits and dahs in a code symbol. The dah length does vary with the code speed, as does the space between words. The space between words is basically twice the length of the dah being sent, plus one dit length. If you are sending code at 5wpm, the space between two words should be about 11 dits long, and it is most easily obtained at this slow speed by taking your hand off the key between words. Good code sounds smooth and pleasant at any speed. Expend the time and effort required to develop good receiving and sending capabilities. Give yourself the option to operate code whenever you wish to do so; don't be forced into other modes of operation due to poor code ability."

While rummaging through some old files I came across some data which may help if you are considering putting up a new antenna.

One of my favourite antennas, which has been up for about six years so far, is a 80/160m trapped dipole that still works well. It was originally to be a multiband dipole, but it proved impossible to tune to the exact band-segments I wanted on each band.

Anyhow, here are the requirements for making up the traps.

The formers used are simple lengths of plastic plumber's pipe, the 3.55MHz trap uses pipe which is 44mm OD, and all the others use 32mm OD pipe. The coax is cheap RG58/U. The method is firstly to drill a hole near one end of the former through which the coax is threaded, wind the required number of turns, and drill another hole to thread the coax through. Don't forget you need to wind one trap left-handed and one right-handed for a balanced dipole. A suitable amount of each end is then bared, remembering the inner of one end has to join up with the outer braid of the other end, and that this join has to be made inside the former tube. If you have not already done so, drill a hole near each end of the former through which you can tie the antenna wire legs, before connecting them to the coax

ends. If you want to tune the traps, you can do so by spreading the coils slightly. I'm sure you can figure out the rest of the details, for example, my 80/160 dipole has the normal 66 feet of wire in each leg (which you tune up first), then the 3.55MHz trap, followed by another 40 or 50 feet to tune the antenna on 160 metres. Theory says you need to add 60 feet per side, but I found the traps' presence required cutting a fair amount off that 60 feet in order to tune the antenna.

Here are the measurements for the coils of coax:

3.55MHz trap	21.25 turns on 44mm OD
7.05MHz trap	14.5 turns on 32mm OD
10.1MHz trap	11 turns on 32mm OD
14.0MHz trap	8.5 turns on 32mm OD

The formula I used for finding the length of wire in a dipole is 468MHz in feet. If you want to convert to metres you can do it yourself!

73s, Gil

ar

Education Notes

Brenda Edmonds VK3KT – WIA Federal Education Co-ordinator
PO Box 445 Blackburn 3130

Elsewhere in this issue readers will find the draft of the revised version of DoTC brochure RIB71. Under an agreement between the WIA and DoTC it is being published widely so that all amateurs will have the chance to read and, if they so wish, comment on it before it goes to the final printing. Please note the closing date for comment to reach DoTC.

This revision has greatly simplified the regulations under which the Amateur Service operates. After extended discussion and negotiation, a number of the requirements which we have observed for many years have been deemed to be part of the self-regulation which is expected of a responsible body of operators. In the current moves towards devolvement of authority from DoTC, it is seen as appropriate for many matters which concern amateurs to be managed by amateurs.

In addition, this revision makes provision for extra privileges which have been sought for some time by the WIA, including the Code-free Novice licence, or Novice Limited grade, and increased permitted power for combined calls on the HF bands.

No doubt some members will disapprove strongly of a new, "lower" entry level licence, or increased privileges for combined licensees, on the grounds that "I had to work for the privileges I hold" or "There will not be any incentive left for upgrading to full call". All these arguments have been heard a number of times over the past few years. The records show, however, that few novice or limited licensees are content forever with their restricted privileges, and novices, in particular, are quick to seek extra qualifications.

Incentives may be needed more to attract new recruits into the hobby than for upgrading. In a society where personal communications devices are cheaper and more common than ever before, some members have expressed doubt that the privileges conferred on a new amateur are worth the effort expended in gaining the licence. Other modes are so much easier to access and to use. To allow a broad range of potential amateurs to "taste" the hobby, we need an easy entry qualification, then an enthusiastic group of experienced amateurs to demonstrate the scope, challenges and rewards gained by achieving an unrestricted licence.

The survival of Amateur Radio as a hobby (way of life? interest? passion?) will depend on the enthusiasm and energy of present and future amateurs, because these will determine the strength of the voice of the Amateur Service. It was pointed out by one of the DoTC visitors at the recent WIA Federal Convention that the licences held by amateurs comprise less than one percent of the total licences managed by DoTC. I am sure we all consider ourselves much more important than that in the scheme of things!

ar

AMSAT

Bill Magnusson VK3JT – Packet VK3JT @ VK3BBS

National Co-ordinator
Graham Ratcliff VK5AGR
Please take note of the AMSAT information nets:

AMSAT AUSTRALIA net:
Control station VK5AGR
Check-ins commence at 0845z on Sunday nights
Bulletin commences at 0900z
Frequencies 3.685MHz or 7.064MHz. At present 7.064MHz is used.

AMSAT SW Pacific net:
2200z Saturday on 14.282MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA Divisional broadcasts for regular AMSAT information.

AMSAT Australia Newsletter and Computer Software:

Satellite users, whether experienced or newcomers, will benefit by subscribing to the AMSAT Australia newsletter and software service. The newsletter is published monthly by Graham VK5AGR. Subscription is $20 payable to AMSAT Australia, addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide 5001

The newsletter provides up-to-date information on all current and planned satellite activity. Graham also provides a first class software service for satellite users. New software is reviewed regularly in the newsletter.

Satellite server on new packet BBSs:

If you're fortunate enough to have a local BBS that has recently changed over to the new F6FBB board, you've probably already noticed that it has a lot more goodies than the W0RLI or MBL boards. It also appears to be a lot faster in operation.

The satellite server is particularly interesting. It should be very useful in a number of ways. Auto-update will assure the BBS will be a reliable source of up-to-date keps. The satellite descriptions data bank (if kept up to date) will be a good source of info for the newcomer. The tracking program itself seems to be accurate and comprehensive.

All in all it ought to provide good reference data particularly for newcomers to satellite operations who do not as yet run a full-blown auto track and update system.

Weather satellite report:

In the March column I asked for expressions of interest in a small segment on WXsats. So far I've heard from only one amateur. He was in favour. There may be more people interested; please let me know. I can't really do it unless there's a lot more interest.

KITSAT-A

This satellite appears to be on schedule for a launch in July 1992. The current target date is 24 July. It is a result of a collaborative educational program by the University of Surrey and the Korean Advanced Institute of Technology (KAIT). The device is being built at Surrey by KAIT engineering students under the guidance of the UoSat team.

KITSAT-A will have a rather unusual and interesting orbit. It will have a semi-major axis of 7700km and an inclination of 66 degrees. I've run a few figures through the computer and, if this orbital geometry is achieved, we'll have a very useful satellite indeed. An SMA of 7700km results in a mean motion of 12.8491322

rev/day. It will orbit at an altitude of 1324km (822 miles) which is rather reminiscent of the old faithful Oscar-7. It should have an orbital period of 112 minutes and a maximum access time of 21 minutes on an overhead pass. The maximum communication range (footprint dia) will be 7590km. The 66° inclination will take it over just about every populated part of the Earth. At that inclination it'll go across the southern sky quite a lot in VK, so your auto tracking will need to support flip-over or some other way of "tracking through south".

The payloads on KITSAT-A are also of major interest. It will have the now almost standard PACSAT comms system. Running at 9600bps it will use 13mBytes of CMOS SRAM for message storage. If you have a UO-14 (UO-22) system up and running, it will be immediately usable on KITSAT-A.

It will carry an improved version of the UO-22 Earth imaging system with twin wide-angle and tele-lens systems.

A first for KITSAT-A will be the digital signal processing experiment. It will be used for speech synthesis, store and forward speech relay and high speed modulation experiments.

The cosmic ray experiment will provide valuable data on the radiation environment and there will be the usual array of UoSat type telemetry which will be decodable on presently available software.

Watch for this satellite, it should be a beauty.

AO-10 keps

There was a report recently that NASA may have discontinued publishing keps for Oscar-10. This is being looked into and should be resolved before too long. In the meantime, don't worry, the keps for Oscar-10 (and Oscar-13 for that matter) will remain accurate for at least six months. You can prove this for yourself by manually loading an old set - say 12 months old - and compare the result. Of course, you can't afford to be so relaxed about the low Earth orbiters. The lower they are the more often you have to update.

ar

FTAC Notes

John Martin VK3ZJC FTAC Chairman

Records

A couple of months ago I described a new national 6m record set by VK2QF and CU3/N6AMG as "almost unbeatable". Well, I did say "almost". This record has now fallen to Mike Farrell VK2FLR, who also worked CU3/N6AMG over a distance of 19424.1km.

There is also a new ACT record for the 1296mHz band, between Ed Penikis VK1VP and a certain nondescript known as VK3ZJC. The contact was made by aircraft enhancement and the distance is 451.7km.

Data base update

The next publication of the *Data Base* will be in the 1992-1993 *Call Book*. The deadline is expected to be in late July, so all beacon and repeater licensees are asked to check the details in last February's magazine and advise of any changes. The site details, omitted from the February list to save space, will be included in full in the *Call Book* listing.

Band planning

It is proposed to allot 52.600/53.600MHz as a national WICEN portable repeater channel. Two WICEN simplex channels are also proposed on 53MHz. It is also suggested to allot 434.950 and 439.950MHz for use by WICEN portable repeaters, including packet. These channels are a voice repeater pair, but the use of one or the other for packet would reduce co-site interference between portable voice and packet repeaters.

Comments on any of these proposals would be appreciated.

ar

EMC Report

Hans F Ruckert VK2AOU, 25 Berrille Rd, Beverly Hills 2209

Fluorescent lamp and RF radiation

VK4OE submitted an interesting report from the "Hospital Engineering Connection" paper on the new Philips Fluorescent Lamp operating on 2.65MHz, operating with increased efficiency and expected to outlast older fluorescent lamps by 50,000 hours. We know the older familiar fluorescent lamps do cause radio interference if unshielded receivers, feedlines and antennas are too close. One wonders whether the new lamps present EMC problems. DL1BU mentioned that the new lamps were formerly operating near 3.6MHz, but that apparently the influence of radio amateurs caused the move to 2.65MHz. It remains to be seen whether this change is good enough.

EMC Reports

A number of EMC reports published in *Radio Communication* were again submitted by Norm Burton. All of us can benefit from the excellent EMC work done by the UK RSGB EMC Committee under the chairman G8SOZ.

2.1. *Radio Communication* December 1991

"EMC down the salt mine": $A1 million EMC test centre was established 200m below ground in an air-conditioned tent 35 x 16 metres near Winsford in Cheshire. This was one way to make sure that unwanted RF neither escaped nor got into test equipment.

2.2. The flasher units of several motor car models have become known to be far too susceptible to mobile radio transmitters and the radiation from high powered stationary radio transmitters. The recommendation of an American car dealer "to shield the transmitter antenna", was not very helpful, but shows the problem! The problem was solved by connecting two 100nF capacitors from the flasher unit terminals to the car chassis ground.

2.3. *Radio Communication* January 1992

Telephone EMC Cure

To overcome susceptibility of electrical devices to legal and unavoidable RF radiation is only half the problem, the other half is find and educate officials of the responsible organisation, who understand the facts, accept the responsibility and are therefore able and willing to solve the problem. It took several attempts by the EMC committee members to get a Post Office official, who understood the problem with a BT-Telephone, to have filters and a different phone installed. Other officials of the Telecom Faults Department had flatly refused to co-operate.

2.4. *Radio Communication* February 1992

Testmagazine reports important RF field strength measurements near the Flyingdales Early Warning System in Yorkshire. Field strengths of 30 volts/metre on roads in this area and peak values three times higher were also found. These conditions are of great concern to motorists, because modern cars use very RF-sensitive devices for motor and brake operation and the function of associated car equipment, besides the car radio. Car problems have been found with Fiat Panda, Ford Cosworth, Citroen, Vauxhall Cavalier, VW Golf. Blaupunkt Radio taxi equipment operation etc is more or less susceptible to

25W of HF, VHF and/or UHF transmitter power.

Even 400mW from a 70cm handheld transceiver in one case affected the engine management system. The term EMS, Electro Magnetic Susceptibility, is now being used.

2.5. Statisitcs

Eighteen EMC co-ordinators compiled the following statistics. Amateur radio operation affecting:

B-telephone 41x	Others 10x	Radio 15x
TV: UHF 74 x	Cable TV 1 x	Satellite TV 9x
HiFi 19 x	Cars 5x	Alarms 8x
		Others 14x

Amateur radio operation interfered in 29 cases like: fax machines, power lines, alarm systems, satellite TV systems, computer, digital phone systems, fluorescent lighting, thermostats, TV masthead amps, radio teleswitches, gaming machines (in restaurants).

Since both sides suffer equally badly, the EMC problems should always be solved in a reasonable, co-operative manner, not by non-technical legal arguments.

2.6. *Radio Communication* April 1992

A detailed EMC report covers several cases of RF-susceptible alarm systems using Passive Infra-Red (PIR) sensors. In some cases 70W on 7-28MHz triggered the neighbour's new alarm. Using a different make of sensor solved this problem. Some firms, like Visonic Ltd (of Israel) and Optrex Co Ltd, claim to have immunity to RF fields of at least 20V/m up to 1GHz. In a different case 5W on a 3.5-7MHz dipole caused the alarm to bleep. Several more "alarming problems" are described, showing that the problem can be solved in all cases by proper engineering on the manufacturer's side - not by the radio amateur.

3. Amateur Radio and Cable TV *CQ DL* 4/1992, page 237)

The Executive of the DARC had talks with members of the German Parliament who are committee members dealing with communication matters. It was absolutely necessary to inform these parliamentarians of the problems caused by the cable TV operators using the radio amateur exclusive 2m band for channel 6 cable TV, causing interference to amateur radio reception and susceptibility problems to cable TV reception. Otherwise they would hear only the arguments of the cable TV operators. **ar**

Spotlight on SWLing

Robin L Harwood VK7RH – 52 Connaught Crs, W. Launceston 7250

Well, winter has finally arrived here and reception of European stations is coming in very well on the long path on the major broadcasting allocations. I have noticed though, that the number of simultaneous channels has been reduced, allowing signals from other broadcasters to come through. Even so, I have noticed some broadcasters are utilising the same channel to identical target areas, ie the Pacific coast of North America. Deutsche Welle in Cologne, Germany, is broadcasting in English at 0500 UTC on 11925kHz at the same time as Radio HCJB in Quito, Ecuador. Both are beaming to the same area. The German station is on for only 50 minutes, yet it did not realise HCJB has been on 11925kHz for a number of years at 0500 UTC.

And while we are on HCJB in Quito, I have noticed a spurious emission from it on 12100kHz around 0800 UTC. At that time, they broadcast to Europe and the South Pacific on two different channels and presumably are mixing somewhere along the line. The two channels are as follows: 11730kHz from 0700 to 0830, directed to Europe; 11925kHz from 0730 to 1130, directed to the South Pacific. The latter channel is extremely strong here, naturally, although 11730 is quite audible. The other channel of 9745kHz to the South Pacific is always reliable in this area. However, 15270kHz to Europe varies in level from day to day.

On 21 April I was tuning across the bottom edge of the 15m amateur band around 0600 UTC, looking for Europeans on the LP, when I came across a strong broadcasting station on exactly 21000kHz. Naturally, my curiosity was aroused, as I'm also the IARUMS Co-ordinator for VK7. It turned out to be Radio Australia, broadcasting from Melbourne.

There was quite pronounced QSB on the signal, between a strength 7 and 9+. The usual RA channels of 21525, 21740 and 21775kHz were at their normal levels here, so I checked on my FT707 as well as the Icom R70, and the signal was present on both. So I put in a quick call to the RA offices in Melbourne and alerted them that something could be amiss. About 45 minutes later, I was notified by RA Master Control that it indeed was on that frequency and had been tracked down to the Darwin transmitter site. Apparently one of their senders had been put on the dummy load. They also informed me that it also had been monitored at a DoTC receiving station in Perth (WA). There were a few red faces, no doubt. The efficiency of the dummy load has been questioned, if signals were heard quite well from it at either ends of the continent.

I have heard another DX program on Radio WWCR in Knoxville, Tennessee. It is on at 1130 UTC on Tuesdays. The frequency is 15690 and it is always very clear and strong here. The program consists of ham radio news from Gordon West, Clandestine Radio, plus a weekly propagation report, and is titled "Signals".

Incidentally, don't be confused by the appearance of the BBC World Service "Newsdesk" program on 9700kHz at 1100 UTC. It is actually being relayed by Radio New Zealand International. It is a six-month trial to gauge listener response. It is handy for me as the BBC Kranji relay on 9740kYz suffers severe splatter from Radio HCJB on 9745kHz. The Sackville relay to eastern North America also carries the same program on 9515kHz; 12095 and 15070kHz from the UK sites are only fair at that time. The BBC Kiwi relay is about one second behind the UK sites, and 300 milliseconds behind either Kranji or Sackville. The Print Handicapped stations also relay the BBC World Service on AM between midnight and dawn local time. Also concerning NZ, an AM network has been established by an entrepreneur to relay the "Beeb".

Well, that is all for this month. Until July, all the very best of listening and 73.

ar

Repeater Link

Will McGhie VK6UU @ VK6BBS – 21 Waterloo Crs, Lesmurdie 6076

True FM

Direct Frequency Modulation of a repeater's transmit crystal results in higher quality audio from your repeater. Included is a circuit to provide up to 10kHz of deviation at the repeater's output.

This circuit can be used to frequency modulate the transmit crystal oscillator circuit in a Philips FM828 and FM747. These VHF and UHF radios have almost identical oscillator circuits, and the point X is the same for both. The audio level required varies from crystal to crystal, but about two volts peak to peak is required.

The earth end of the crystal must be isolated from the rest of the oscillator circuit, and this is shown as point X. From this point to ground now becomes the variable capaci-

tance point that shifts the oscillator frequency high and low to produce the FM deviation.

Because capacitance is introduced into series with the crystal, where previously there was none, the oscillator centre frequency shifts high. To minimise this shift, four or more varicap diodes are wired in parallel, and the oscillator re-netted by the existing L1. A fixed capacitor could be placed in parallel with just one varicap, but more deviation for less audio input results from adding extra diodes.

A fixed DX bias is applied to the varicaps via the 47k resistor. This resistor, along with the 100pF capacitor isolate the RF from the crystal to the audio circuit. The voltage source for this must be regulated.

The BB809 diodes are cheap if you can find them. They are a wide capacitance shift diode, some four times greater than the BB102. This means more deviation for less distortion, as the diodes are operated over a smaller portion of their voltage to capacitance transfer curve.

Different Opinion

Feedback from Gareth VK2ANF makes for interesting reading. My opinion on cleaning up poor amateur audio before it is transmitted from a repeater, has touched a sore point with Gareth. One paragraph from Gareth's correspondence summarises his position.

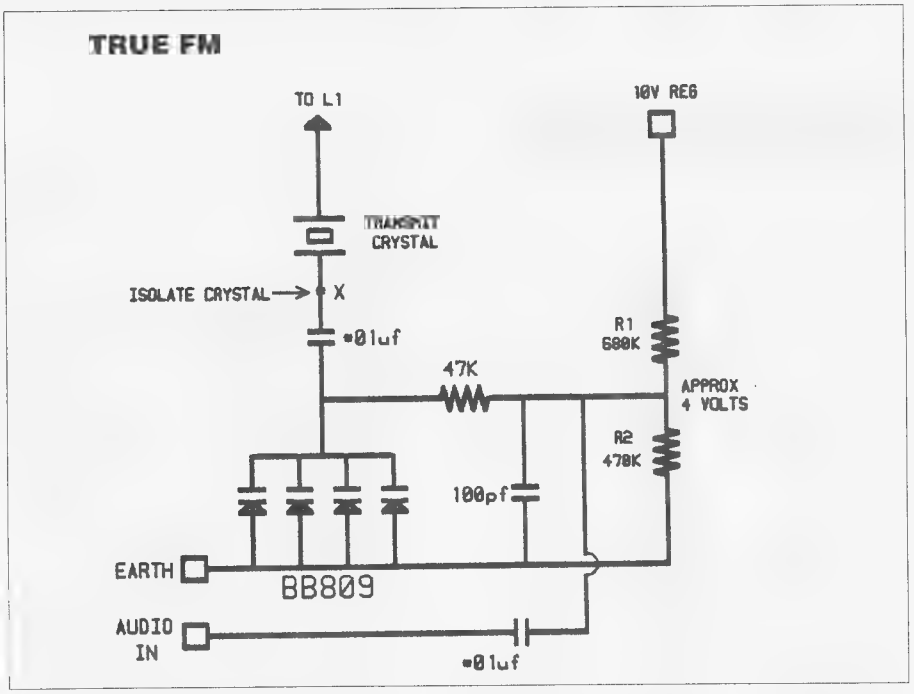
"Why should you or I or any other repeater manager clean up someone else's bad signal? If they over-deviate or are off frequency, let them pass through distorted; if they under-deviate, let them sound like they're whispering. It's not our problem."

Even though I'm an advocate of automatic audio gain control in a repeater, I have sympathy for leaving poor amateur audio as such, in the hope that the amateur will correct the problem. However, after many years of listening to wide variations in audio levels and quality, audio AGC was tried on a repeater, with pleasing results to the ear.

If amateurs can be convinced to adjust their equipment to produce the correct audio on transmit, to suit their speech level and operating situation, then this is by far the best situation. Unfortunately this has proved to be impossible. The reluctance of amateurs to give reports on the quality and quantity of audio from amateurs they are having QSOs with is the biggest problem. If you have poor audio, you don't know unless you are told.

Repeaters are the reason why poor audio can be put up with. Because of the strong signals they radiate, audio deficiencies can be compensated for by the receiving station turning the volume up and down to suit the widely differing audio levels. The deterioration in signal to noise is not a problem with FM when you have RF signal level to spare - well almost. Some audio levels are so low you can run out of volume control and/or the low audio simply slips below the white noise.

Not all the blame for poor audio can be levelled at the amateur, however. Some FM



transceivers have difficult-to-get-at Mic gain pots, or insufficient range on the mic gain, or in some cases, no mic gain pot at all. Until all these problems can be sorted out, many amateur signals you hear on your local repeater are going to be difficult to read.

If the amateur with whom you are in QSO has low audio, tell him or her. Comments like, "didn't get much of that", "I must be in a poor location" or "there must be a problem with the repeater" show a lack of understanding of the equipment and operating mode you are using. If the S meter on your receiver is near full scale and you are having a problem with another amateur's audio, let the amateur know.

Gareth's correspondence contained not only criticism of cleaning up poor amateur audio, but some constructive suggestions on how to improve poor audio.

A test transponder is one idea. Like a repeater, it would be installed at an elevated site, but be allocated its own simplex frequency. Stations dropping carriers on its simplex frequency would be rewarded with a digitised voice announcing how much off-frequency they are and their signal strength. Modulated stations would get back a peak deviation report and a 10-second reply of their audio. Wouldn't that come as a surprise to some of us with lousy audio?

Several repeaters around the country have some user feedback to let you know if you are off frequency etc. Few, if any, have comprehensive on-air testing of amateur FM transceivers. What a great idea if such automatic on-air testing could be set up in many areas.

Here in VK6, on-air testing has been carried out from time to time. Stations call in and are told their frequency, deviation and, most importantly, mix level. To set up such a test system is very easy. A correctly lined-up transceiver, with a discriminator meter and audio output to a CRO, are all that is required. The DC output from the discriminator allows easy calibration of the audio deviation on the CRO. Frequency inputs 10kHz high and low from centre frequency can be used to set the vertical gain on the CRO. That is, correct frequency reads centre trace on the CRO. Ten kHz high is set to read 10 positive divisions and 10kHz low 10 negative divisions. The CRO is now set up to read in 1kHz steps per vertical division.

With a little practice at looking at speech wave forms on a CRO, a lot of information about the audio can be interpreted. Peak deviation, mic gain setting, type of clipping or compression and frequency response are easily seen.

In a later article of Repeater Link I will include some drawings of speech wave forms of amateur FM signals, both good and bad. The level variation between amateur FM signals may come as a surprise to you, but audio level differences of as much as 20dB - yes 20dB - are not hard to find.

It is important to understand that these are audio differences, not RF differences. RF signal level has no bearing on audio levels in a frequency modulated system. An S9 plus 50dB signal will have the same audio level as a S1 signal, provided the transmit audio mic gain and deviation are set up correctly. There is also no AGC in an FM receiver like there is in an AM receiver. There is no need. As has already been stated, RF level has no bearing on the audio level you hear out of the loudspeaker.

I may be talking down to most FM users, but listening to QSOs on repeaters from time to time, there is a need by some of us to better understand the Fun Mode. **ar**

Intruder Watch

Gordon Loveday VK4KAL – Aviemore, Rubyvale 4702

March 1992

Freq	UTC	Date	Mode	Comments	X
7002.5	1220+	020391	A1A	V beacon	17
7048-9	1040+	230292	A1B/A1a	UHF3 last hrd 28/02 ID at end	6
7080	1235	030292	A3E	B/c news & music. Asian?	2
14004	1103	030392	-	No ID but series of V hrd	
14005	1915	190392	NON	Plus A3E male voices	
14045.5	1300	Daily	2 x LSB	Dialling tone & carrier	39
14058	0843	080292	AC3/NON	Helschreiber fax China?	24
14063	0800+	230292+	PON	No further info	20
14070.5	mni	daily	A1a	VRQ tfc to VBX on freq	24
14075	mni	daily	A1A	VRQ tfc & calling CQ	42
14075/80	mni	daily	A1A	KFB CQ de KFB as PHL QSV K	13
14092	0715	280292	A1A	RGT77 940 BT DDD coded msg	3
14095	0200/5	090392	A1A	VPC, CQ de VPC as may QSV	14
14100	0936/40	mni	A1A	ZBK de NZB QSV K tfc out	17
14174	0820	020392	A1A	KLV + H/S data, 3kHz wd sm freq	1
14177	0933	280292	F1A	UID80 & PL7 tfc	5
14190	1300	070392	PON	Motor-boat abt 20kHz wd	
14210	mni	daily	A3E	fx2 of 7105 R Espana/splatts	23
14211/15	mni	0203+	2xF1B	Both 250Hz 3rd register, CIS	18
14215	mni	290292	A1A	P7A from P9K QSA?QSV K	13
14217.5	0815+	230292+	F1B	UMS vry active, 200Hz, MNR, CIS	17
18068	0940	110292	A1A	PTA1 vvv CQ de PTA1 pse QSO ZHG	
18080	1242	290292	A3	B/cast Chinese	
18105	1205	260292	A3E	Weak b/c station no ID	
18119	1033	010392	A1A	B9D calling CQ QTC	1
18125	1210	260292	A3E	B/cast stn Russian?	3
18135	0744	090392	PON	OTHR	
18140	0935	020392	A3E	B/caster, m announcer??	
21001	0400+	250292+	NON		22
21031.5	0040	240292	F1B/A1A	Tfc to UUU UMS in cw +5figs	39
21065	2039	110292	F1B/A1A	RTTY idling	2
21230	0500	110392	PXX?	Points to Black Sea area	
21250	1000+	250292	R7B	4kHz wd	3
21283	0400+	230292	A1A/F1B	Most 200Hz tfc to UU UMS	47
21315	1100	260292	A3E	B/C carrier & voices	13
21340	1104	300392	A3J	Radio Pakistan	
21326	0507+	270292	A1A	P7A FR P8S WSA?QSV R QRK 4RF	16
21369	0605+	160392	A1A	P7A de P8V R RF2 W AS	19
21450	1255	010392	A3E	English b/cast, Rad Moscow	12
24895	0637	020392	A3	Chinese military	4
24925	1158	030392+	J3E/L	Russian military stn	7
24970	1108	120392	A1A	de Q1DT, de Q1DT??	
28004	1320	1303	A3E	Pyongyang Nth Korea/music	2
38035	1352	1303	A3E	Identical to above	
28980	1206	110392	A3E	Chinest b/c music	6
29370	1335	130392	A3E	Russian language b/cast	

PON OTHR on 28 & 28MHz at S9 from VK6 area.
*CIS - C'wealth Independent States, formerly USSR.
My thanks to VKs 4BG, 4OD, 4AKX, 4BHJ, 4BTW, 4BXC, 4EKA, 5TL, 5GZ, 6LG, 6RO & 6XW. ar

ALARA

Jenny Adams VK3MDR – 70 Kangaroo Ground Rd, Wattle Glen 3096

The Victorian Foxhunting Champions

On the Friday night, the decision was made to compete. The team consisted of only two people; a third was really needed for map reading and navigation. Nobody could be found after several phone calls., so it was left as a two-person team. On Saturday at approximately 7.40am, I volunteered my services, keeping in mind we would have to take the children. Hesitation on OM's part. I decided to do some last-minute shopping for the family's Mother's Day luncheon. I left at 8am, returning 25 minutes later, having been to the butcher, greengrocer, bakery and supermarket. On my return we decided to go.

We were due to be at Greensborough at 9am (15-minute drive) to fit the doppler, antennas and radios. Philip decided to do some "just in time" engineering of a shelf and I packed the nappy bag, lunch and children. We got to Ewen's only 10 minutes later than expected, to find his son was coming, too, for part of the day.

While the antennas etc were being fitted, I fed Kate (nine months old). It was a case of breathe-in and seat belts on, and we were on our way. Upon our arrival we registered under my callsign. There were a few bemused looks at people discovered our car half full of people under the age of seven.

We had our fair share of equipment malfunction, mis-navigating and failure to find the fox. The hunt before lunch we broke the antenna pole, so dashed back to Ewen's place for some running repairs. Upon returning to the starting point we discovered the lunch break had been shortened and the 2m sniffer hunt was in progress. We missed by 10 feet.

So our day continued with more or less success, and the same could be said for the local QRM. Barry (age three) at times preferred the play equipment. (Thank you to Brenda and Bev for keeping an eye on him!). On the last hunt we should have gone over the river (90 per cent of the time that is what the fox does), but we didn't and, consequently, discovered our error too late.

Each event was awarded 1st, 2nd and 3rd place with a choice of prizes. We finished with four sheets of circuit board and 241 resistors. The final result overall to the VK3MDR team … 2nd. I still have the grin on my face. It was take-away for tea that night; the week's routine is in shambles, but we had a ball!

I can still remember our first attempt at the championships several years ago. With borrowed equipment 10 minutes instruction, no children and one dog. We came … last. So we have improved.

Cheers for now, Jenny VK3 MDR

ar

Amateur Radio
Helping the community

WICEN – NSW

Dave Horsfall VK2KFU, NSW Deputy Co-ordinator

WICEN Sydney North held a committee meeting recently, the first since the election of office-bearers, and some of the activities for the year were discussed.

The date of the next WICEN Sydney North general meeting will be Wednesday 24 June at the Ku-ring-gai SES headquarters, starting at 8pm. The latest developments in Sydney North will be explained, including first-aid training, bushfire training and a "hands on" exercise to be held on Saturday 27 June. A committee meeting of WICEN Sydney North will be held the Wednesday before, 17 June, at the home of Jo VK2KAA at 7.30pm.

Listen to the Sydney WICEN net on the 2m repeater VK2RWS, channel 7150, every Thursday night at 9.30pm, for more details of Sydney WICEN happenings. **ar**

Club Corner

Moorabbin & District Radio Club

Life members honoured at M&DRC

On Saturday afternoon 28 March, 70 members and friends of the Moorabbin and District Radio Club gathered at the clubrooms for a function at which 15 life members of the club were presented with newly created life membership certificates and badges.

Peter Gamble VK3YRP,Federal president of the WIA, was a guest and made the presentations.

As each presentation was made, Trevor VK3MGD and Ken VK3TKR alternated in reading an account of that member's contribution to the club.

The afternoon concluded with a well catered afternoon tea and an expression of thanks to all attending by secretary Denis VK3BGS.

The honoured guests are shown in the photo.

Back row: Trevor Armstrong VK3MGD (Vice President), Ken Millis VK3TKR, Keith Turner VK3CWT (President) and Denis Babore VK3BGS (Secretary). Centre row: Peter Gamble VK3YRP (Federal President, WIA), Harold Hepburn VK3AFQ, John Emery VK3UA, Allan Doble VK3AMD, Morrie Lyons VK3BCC (Treasurer), Roger Thomas VK3RG, Len Jackson, John Dawes and Doug Richards VK3CCY.
Front row: Bill Yates VK3SB, Alf Chandler VK3LC, Ed Manifold VK3EM, Bob Patterson, Milton Crompton VK3MN, Ray Fowler VK3BHL and Percy Sebire VK3MX.

Successful Hamfest

The new venue for the Moorabbin & District Radio Club Hamfest at the assembly hall of Brentwood Secondary College, held on 2 May, was crowded by 500 or so eager buyers, sellers and other interested visitors.

Demonstrations of ATV and packet were given from time to time. The club had its various projects and kits on display and found the interest very gratifying.

Allan Doble VK3AMD

Barossa Amateur Radio Club

On Sunday 5 April 1992, the Third Annual Mt Pleasant Radio Picnic Day, hosted by the Barossa Amateur Radio Club, was held at the Talunga Park Showgrounds at Mt Pleasant.

This year the event was upgraded from amateur radio only, to an event that covered amateur radio, CB radio, vintage radio and many other forms of radio-related activities. The biggest change was the participation of ACBRO in the event. ACBRO actively publicised the event to its members, and on the day provided a display of CB and vintage radio. A very large number of CB operators attended on the day.

The event was sponsored by Dick Smith Electronics and Castrol Australia, as well as by minor sponsors Countrywide Mobile Communications, Electrophone, Johnston Electronic & Audio Visual Services, WIA Equipment Supplies Committee and ZCG Antennas.

The weather in Adelaide on the day before the event and also on the picnic day was fairly wet, and this possibly reduced the numbers that attended. Even considering the weather, a total of 450 people still attended the event.

Activities got under way with a 2m foxhunt which was won by Andrew VK5EX from the South Coast Amateur Radio Club, and finished with an interclub tug of war which was won by a joint team consisting of members from ACBRO clubs.

Throughout the day there were many activities for both adults and children alike, with prizes in excess of $1000 for the winners. A raffle with prizes totalling $500 was also held on the day.

The day was a good opportunity for bargain hunters to save money on both new and second-hand equipment.

New equipment at substantially reduced prices was available from Dick Smith Electronics, Countrywide Mobile Communications, Johnston Electronic & Audio Visual Services, Microwave Developments, WIA Equipment Supplies Committee & Bookshop and Stewart Electronic Components.

A large area was set up for buying and selling used equipment. A large number of people were seen leaving with lots of newly purchased goodies under their arms.

Several groups and individuals provided displays covering CB radio (ACBRO), vintage radio (Historical Radio Society of Australia), vintage military radio and miscellaneous equipment (several individuals), Outback communications (Royal Flying Doctor Service), vintage military vehicles (individuals) and ALARA.

Planning is well under way for next year's event on Sunday 28 March 1993. This will be bigger and better than this year, and will be housed in the Agricultural Pavilion, which is equipped with 60 permanent trestle tables, thus allowing for a greater number of dealers to take part. Other activities will be held in the Main Pavilion, with any overflow into the Sheep Display Pavilion. A major outdoor electronics display is also planned (details to follow).

Having the majority of the displays and trading tables inside the various buildings within the showgrounds will ensure the weather will not deter people from attending.

For those who wish to plan ahead, the dates for forthcoming Picnic Days should be 27 March 1994, 26 March 1995, 24 March 1996 and 23 March 1997.

Any dealers who wish to participate in the 1993 event can obtain a dealer registration form from the Barossa Amateur Radio Radio Club, PO Box 356, Angaston SA 5353.

The club president, Steve Johnston VK5ZNJ can be contacted on (08) 287 1064 or fax (08) 287 0422.

Steve Johnston VK5ZNJ
President BARC ar

QSLs from the WIA Collection

Ken Matchett VK3TL Hon Curator, WIA QSL Collection
4 Sunrise Hill Road, Montrose 3765. Ph: 728 5350

Danzig - and what's on that old QSL card? Part I

Ask most of the younger generation where Danzig is, and one would be met with blank faces. Mention the Polish name of this city, Gdansk, and most would recognise it as a Polish shipping centre and the birthplace of the Polish trade union movement, Solidarity. Danzig (to give it its German name) will be remembered by pre-war DXers, since in those days it was a separate "country" for the pre-war DXCC.

From Slav origins, the area of Danzig was taken over by the Teutonic Knights, a military order that enforced Christianity during the Middle Ages. As a prosperous port, Danzig gained its autonomy as early as the 15th century, and when Prussia became a powerful European state, Danzig was ceded to it. With the conquests of Bismarck, Danzig became the capital of West Prussia, but after the end of WW1, gained its free city status again under the Treaty of Versailles. It is interesting to note that the major excuse for Hitler's invasion of Poland (with no fewer than 54 army divisions) on 1 September 1939 was the German claim to this territory and the refusal of Poland to yield up Danzig as a free city within the framework of the German Reich. After the end of World War 2, the German population (approximately 90 percent) was deported and the territory resorted to its Polish name, becoming part of post-war Poland.

Under the terms of the historic Washington Conference of 1929, callsign prefixes had to indicate the country from which they originated. The prefix block YMA-YMZ was allocated by the ITU to the "Free City of Danzig".

Experimental radio licensees were assigned the specific prefix of "YM" by Danzig authorities. The latest listing the writer can find is that appearing in the January 1940 issue of the magazine *Radio* just after WW2 had started. (The USA was not then at war). Danzig continued to be listed in the December 1946 edition of *Amateur Radio,* but the listing was only a guide since, at that time, decisions concerning post-war country listings were just being made. The "Official" Post-War Countries List of the ARRL, appearing in the February issue of the 1947 *QST,* omits Danzig. It would be fairly safe to say there was no amateur radio activity from Gdansk (Danzig) just after the war. In fact, almost the whole of the city had been obliterated and had to be entirely rebuilt. When transmissions from the city resumed they were accompanied by the SP (Poland) prefix.

YM4ZO

The owner of the station was Herr Bussler, a successful DX operator and what the Germans called a "Deutscher Sendemeister und Emfangsmeister" in 1935-36. (German transmitting and receiving master or expert). Herr Bussler won many awards and DX contests before the war, including WIA 1934, 1935 and 1936 awards. He used no more than 36 watts input. The recipient of the QSL was Chas Harrisson VK7CH of Bellerive, Tasmania, a truly Old Timer, who is still active on the air.

The QSL is dated January 1934 and gives a signal report of T9 W4 and R4. The T (tone), W4 (strength) and R (readability) code was used extensively on the Continent before 1935 by German and Austrian stations in particular. The code order of RWT was, however, much more popular than the TWR seen on this QSL card. Many stations throughout the world during the early and mid-1930s were using the signal indication of QSA-QRK-Tone. The Q code QSA from the early 1920s meant "Are my signals strong?". The QRK meant 'How do you receive me?". Sometimes QSB, meaning "Is my tone or spark bad?" was used but, as we know, today it has an altogether different meaning. In the April 1934 edition of *QST,* Arthur Braaten W2BSR presented a paper in which he suggested the simplified code of RST, which we all use today. Unfortunately this took a little time to get used so, some operators using QSA-R-T, effectively changing the meaning of QSA from a strength indication to one of readability. However, the new RST system proved very popular, especially after the ARRL HQ station W1MK adopted it from 27 September 1934.

The time of the QSO is indicated using MEZ, a middle-European time zone. The early experimenters used local time exclusively; signals were seldom strong enough to be sent into a different time zone!!! Even when DXing started to become popular from about 1924, local times continued to be used. Many operators soon realised the importance of using a generally accepted time standard. From 1934, GCT (Greenwich Civil Time) appeared, but many experimenters used both times on their QSL cards. From 1936, GMT was commonly used by all countries, although Greenwich Mean Time itself had been the standard time (for England) from 1880, being internationally adopted four years later. Nowadays we use UTC (Co-ordinated Universal Time), but this is only because from 1 January 1972 the earth ceased to be regarded as the standard timer, since with the remarkable accuracy of today's chronometers, the extremely small variations in the movement of the earth's axis demanded that the atomic clock set the standard of time.

Herr Bussler's transmitter was an Ultraudion (abbreviated to "Ultraud") of 50 watts. This transmitter belongs to the Colpitts family of oscillators. Like the Colpitts, the filament of the oscillating valve is connected to the junction of two capacitors (ie grid-anode coupling is capacitive) but in the case of the Ultraudion only one of the capacitors is across the tuning coil, the other being across the earth end of the coil and the filament. It, like the Colpitts, was was favoured by some operators over the Hartley for higher radio frequencies.

The antenna was the very popular "Zepp" in which one end of the feeder is attached to the end of a single wire. This voltage-fed antenna has seen many variations over the years such as the "two half waves in phase" antenna. It gets its name from the fact that, being an end-fed antenna it could be easily trailed outside the gondola of a zeppelin. (The

WIA QSL Collection contains the QSL, D4BEC sent from the Graf Zeppelin LZ127 in November 1935 using such an antenna).

The receiver was a Schnell O-V-2. The name Schnell will ring a bell with those interested in the story of DXing. It was the American Fred H Schnell who, together with another radio pioneer, John L Reinartz, made the first two-way radio contact between USA and France on the night of 27 November 1923. Schnell had received special permission from the Supervisor of Radio at Boston to use a wavelength of 100 metres. Schnell was, at that time, ARRL Traffic Manager and later a Captain in the US Naval Reserve. (In addition to running the Chicago police station!). Schnell used his call of 1MO, later WO7Z. The Schnell receiver was an early regenerative set. In the early days of radio feeding back into the tuning coil (by means of a "reaction coil") some of the anode output was a simple way of obtaining gain and selectivity. The big problem was, of course, the all-too-frequent excessive feedback which caused self-oscillation. This led to serious interference problems; so much so that, according to some licensing regulations, the operator stood a good chance of losing his experimental licence were his receiver to behave as an oscillator. The code O-V-2 stood for the numbers of stages in the receiver. O-V-2 was a popular choice. The first letter O tells us that there was no RF amplification stage (although at the date of this QSO one stage was common). The V signalled a valve detector stage (in this case the regenerative detector, usually a triode) and the 2 indicated two stages of audio amplification. Readers might be surprised at the attention given by early experimenters to audio rather than radio frequency amplification. It should be remembered that in the early days of radio, from the 1920s to the mid-1930s, the triode valves used gave considerable problems owing to the large capacitance between their single grid and the plate. When tetrodes and pentodes became freely available in the 1930s, and if stages were introduced, radio amplification became an accepted principle. The coupling device of early O-V-2 receivers was just an audio transformer. The HT supply was fed via an RF choke to the triode plate through its primary coil, whilst the grid bias to the AF triode was fed through the secondary winding of the iron cored transformer. Having said this, more fortunate experimenters **did** use one or more stages of TRF (Tuned Radio Frequency) in front of the detector, stability problems having been reduced by the introduction of the screen grid valve in 1928. Such improved signal level arriving at the detector often allowed an AF stage to be deleted altogether. We have to remember too, that sensitivity would have greater priority than audio output to early DXers. After all, the possession of a quality speaker was often out of the money range of the average operator. When pentodes became available commercially in the early 1930s, there was really no need for regenerative detection and, in fact, radio regulations were drafted to outlaw this method of reception altogether.

On the QSL card of YM4ZO we can see a list of the DX countries worked by Herr Bussler, although the prefixes of the countries have changed somewhat. The letter J is now JA, Netherland East Indies PK is now YB (Indonesia) and ZE (Southern Rhodesia) is now Zimbabwe Z2. In those days Mexico was X, ZD = Nigeria, K4 = Puerto Rico, K5 = Panama Canal Zone and V0 was Newfoundland (at that time a separate DXCC country). The DE0676 printed on the bottom of the card indicated (as it still does today) a German Short Wave Listener. In the early days when QSOs with far-away places were a real challenge, many licensed amateurs took "an each-way bet" by becoming instant SWLs when they were unable to make a QSO. Unlike today, the majority of foreign operators in the early days of radio really appreciated SWL reports from DX stations, there being a considerable exchange of QSL cards between the two. The WIA Collection is preserving several hundred such pre-war reports. *(To be continued).*

Thanks

The WIA (Vic Div) would like to express its thanks to the following who have kindly donated QSLs to the Collection.

Percy VK4CPA
Bill ex VK6WY
Ron VK3QP
Mike VK6HD
Stan VK3BSR (ex VK3ASB)
Frank VK2QL
Owen VK1CC
Reg ex VK1RF.

Also to the family and friends of the following "Silent Keys"

Russell Edwards VK3CZ
Fenton Sanderson VK6TS

ar

Divisional Notes

VK2 Notes

Annual General Meeting Deferred

The 1991/92 NSW Division AGM failed to reach the required quorum on 2 May by a half-hour after the scheduled time. The "articles" of the Division were not clear on the procedure, leaving the Council with the only option to defer the meeting date until a date to be advised after seeking legal advice.

The advice was to set a new date and advise members in writing. The new notice is later in these notes. The date has been chosen to take into account the required 21 days notice. It was also pointed out that the "articles" (constitution) of the Division do not address the procedure to be adopted should a duly convened meeting, or an AGM, not attain a quorum. Action is being undertaken to correct this condition.

The new meeting date will also afford mem-

bers an opportunity to participate in a forum discussion on the proposed draft of the next generation "Regulations" for the Amateur Radio Service which you have found in this issue of *Amateur Radio*.

Our thanks to those members who took the effort to either attend - many from country regions - or who submitted proxies for the 2 May meeting. Please note that the agenda for the deferred meeting has changed and that new proxies will be required.

Until the new meeting is conducted and concluded the 1991/92 Council remains in office.

Wireless Institute of Australia - New South Wales Division
Notice of Meeting

The deferred Annual General Meeting of the Wireless Institute of Australia, New South Wales Division, will be held at 2pm on Sunday 28 June 1992, at Amateur Radio House, 109 Wigram Street, Parramatta.

1. Opening of meeting by Chairman
2. Apologies
3. Confirmation of Minutes of the 1991 AGM
4. President's report
5. Presentation of awards
6. Presentation of annual accounts for the year ended 31 December 1991
7. Declaration of the 1992/93 council
8. (a) Appointment of Returning Officer for 1992/93
   (b) Appointment of an Auditor for 1992
9. Notice of Motion to change the Articles of Association of the NSW Division in respect to General Meetings
10. Discussion period (no motions may be moved)
    (a) Members' forum re proposed regulation changes
    (b) Other matters that may be raised
11. Close of meeting

Note: new proxy votes are required to be submitted for this meeting.

Robert Lloyd-Jones, Company Secretary

New Members

Our usual warm welcome is extended to the following who joined the NSW Division recently.

K J	Apps	Assoc	Wyoming
W F	Brown	Assoc	North Bondi
J K	Daniel	Assoc	Port Macquarie
B	Duffy	Assoc	Narromine
J P	Emanuel	VK2XZG	North Rocks
D R	Godden	VK2JDG	Toongabbie
D W	Hall	Assoc	Inverell
P J	Hennessy	VK2KPH	Yagoona
J M	Holland	VK2XZB	Bungendore
L F	Kentish	VK2CFK	East Maitland
J T	Jordon	Assoc	Green Point
G C	Paterson	VK2AHJ	North Ryde
W L	Swinnerton	Assoc	Toongabbie
C E	Webb	VK2CO	Unanderra

Happenings

It would seem little - based on the attendance for the AGM - maybe there were too many distractions. However, don't miss the Oxley Region Field Day this coming June long weekend at Lighthouse Beach, Port Macquarie; Oxley Region ARC, PO Box 712, Port Macquarie 2444. Phone (065) 83 1311. The next Parramatta located Trash and Treasure will be on Sunday afternoon 26 July. Listen to VK2WI that morning for the weather forecast. The next VK2 Division exam will be held at Parramatta late August. Contact the office for details of this or other exams. Also see list of exam sources/locations in recent *ARs*.

Recent work at VK2WI has restored most transmitters to the broadcast format. There are no 20 or 15 relays at the moment. Seven metres is relayed on 18.120, and 12 metres is broadcast from Dural on 24.910. The 6m beacon has been overhauled and is back on line. Tree growth is starting to shield beacon antennas; relocation is being considered. VK2WI seeks a recent 50 watt solid state low/mid band base suitable to replace a very aged BS50 for 52.525MHz. VK2RWI is upgrading packet UHF linking to the various networks. Ch 4850 antenna recently improved. Richard VK2SKY will start to take over some of the broadcast preparation from Dave VK2KFU.

5/8 Wave

1992/3 Council

At the AGM of the VK5 Division, held on Tuesday 28 April, the following members were elected to Council, and as usual to provide continuity, the President, Secretary and Treasurer were elected at a brief council meeting afterwards.

President	Bob Allan	VK5BJA
Secretary	John Highman	VK5PJH
Treasurer	Bill Wardrop	VK5AWM
Past President	Rowland Bruce	VK5OU
WICEN Director	Ian Watson	VK5KIA
	Peter Maddern	VK5PRM
	Rob Gunnourie	VK5FI
	Mark Spooner	VK5AVQ
	Alan Roocroft	VK5ZN
	Chuck Waite	VK5CQ

Other positions will be allocated at the next council meeting.

We welcome to Council two new members, Chuck VK5CQ and John VK5PJH, and wish them a long and happy time on Council. Unfortunately, we also farewell two hard-working members, Don McDonald VK5ADD and John McKellar VK5BJM. Amongst other positions he held, Don was Secretary when I was President, and President after me. He has also been Minutes Secretary and Examination Officer over the past two years. I enjoyed working with him and found he was someone you could always rely on. After seven years on Council he will certainly be missed. I'm not sure how long John has been on Council, three or four years possibly, but during that time he too has been a warmly accepted and valuable member of Council. We wish both of you a healthy and happy retirement.

Diary Dates

6-8 June	South East Radio Group Convention, Mt Gambier
23 June	General Meeting, Burley Griffin Building
30 June	Buy and Sell Night

Examination Dates and Information

I am very grateful to Christine Taylor VK5CTY, who provided me with the dates of all forthcoming examinations in the Adelaide metropolitan area for the rest of this year. She also sent me the information sheets she sends out to would-be candidates. This month we have published the sheets for "General" and "Morse Code Only" exams. Next month we will bring you the "Remote Areas" and "Special Conditions" papers.

Examination Program for 1992

Date	Venue	
4 July	Burley Griffin Building	WIA (SA Div)
8 Aug	Blackwood High School	AHARS
5 Sept	Burley Griffin Building	WIA (SA Div)
31 Oct	Burley Griffin Building	WIA (SA Div)
14 Nov	Black Forest Primary School	Christine Taylor
5 Dec	Blackwood High School	AHARS

Contact Phone Numbers

WIA (SA Div), Don Macdonald	276 1251
AHARS, Alan Haines	276 7091
Christine Taylor	293 5615

Contact must be made at least two weeks before the date of the examinations.

Information for Applicants for Amateur Exams

From January 1992 the amateur examinations will be conducted under the authority of the WIA Exam Service.

In each state there will be a list of official examiners which will be available from DoTC. These examiners will conduct exams at scheduled times and places (available from the examiner or the local Division of the WIA).

All examinations **must** have **two** official examiners present at all times.

Candidates unable to attend scheduled examinations should read the information sheet for **remote areas** or **special condition examinations.**

Candidates wishing to sit for any of the amateur exams should apply to the appropriate examiner **at least three weeks** before the date of the examination.

Payment for the examination(s) will be at the time of application.

On the day of the examination the candidate will be able to obtain a provisional mark at the conclusion of the examination. The official mark and any appropriate forms will be forwarded to the candidate from the WIA Exam Service.

These results, along with any previously obtained qualifications, must be presented to the

Department of Transport and Communication when applying for certificates or station licences.
Good luck!
Prepared by Christine Taylor VK5CTY

VK6 Notes

The AGM came and went, and the composition of the Divisional Council remains much the same. VK6WZ's withdrawn nomination for VP and VK6AFA's ditto for councillor made an election unnecessary. Glen VK6ZGT was the only other nomination for VP, and was declared elected.

The bookshop is again up and running. Bruce Robson VK6ABR is the new man, and is doing a fine job; the same can be said of Nick VK6ND, our new broadcast officer.

Last month trial relays of the Sunday morning bulletins on the top band were initiated by John VK6IM. His first morning (26 April) yielded so many stations on the callback, John was somewhere between shock and delight! He handled it well, however, and 160 metres might become a permanent relay frequency. His best DX was John VK6JX at Thompson's Brook in the south-west.

Judging by comments on air, interest in ATV is on the increase in WA, and the same can be said for UHF and SHF. The VHF group is promoting 10 gigs and there are whispers about a special project for UHF taking shape at Northern Corridor.

Membership of the division continues to grow and, although far from ideal, is still a couple of percent above the national average. Keep talking WIA to your non-member mates, be positive, don't put them down because they're not members, lend them your *AR* occasionally. Gently hint that in this global tug of war between commercial users of the spectrum and amateur radio we must have more hands on our end of the rope, and fewer onlookers!

QRM from VK7

Frank Moore VK7ZMF

President	Tom Allen	VK7AL
Secretary	Ted Beard	VK7EB
Treasurer	Peter King	VK7ZPK
Intruder Watch	Robin Harwood	VK7RH
QSL Manager	Charles Harrison	VK7CH
QRM Editor	Frank Moore	VK7ZMF
Repeater Co-ord	Anthony Tunks	VK7ZTA
Patron	Col Wright	VK7LZ
Federal Council	Jim Forsythe	VK7FJ
Broadcast Officer	John Rogers	VK7JK
Awards Manager	Bob Jackson	VK7NBF

VK7 Divisional Council is now:

VK7BE	Barry Hill, Northern Branch
VK7PU	Phil Harbeck, North West Branch
VK7ZPK	Peter King, Southern Branch
VK7AL	Tom Allen, Southern Branch
VK7EB	Ted Beard, Southern Branch
VK7ZMF	Frank Moore, Southern Branch
VK7JK	John Rogers, Southern Branch
VK7GL	A Dickson, Southern Branch

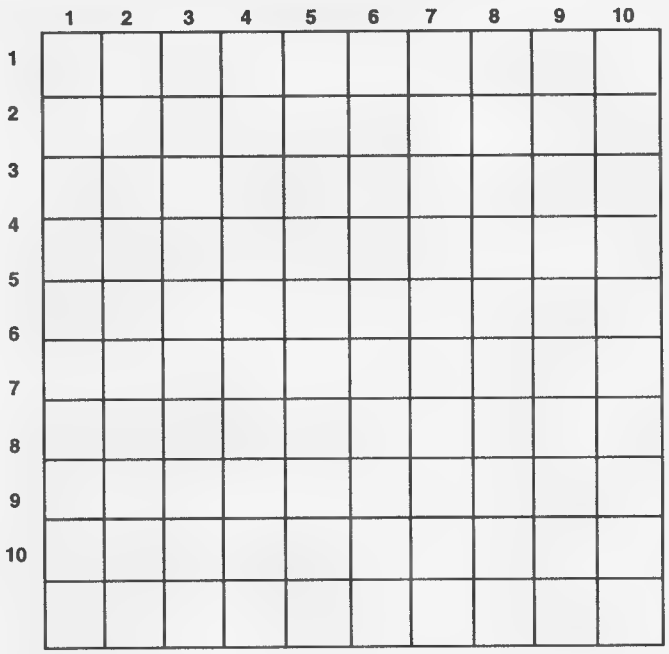
Retiring members of Council are: VK7JG, VK7JH.

New members of Council are: VK7GL, VK7BE, VK7PU. Bob Jackson is retiring as Awards Manager after this year and is looking for a replacement. Any offers?

ar

Morseword No 63

Solution Page 56



Across:
1 cubes
2 travellers pay it
3 smooth material
4 serious
5 thrown at weddings
6 high room
7 patch
8 wreck
9 sieve
10 dressed to the .....

Down:
1 cap
2 rice wine
3 trick
4 flower holder
5 mend
6 ancient
7 barrels
8 smile
9 picture
10 successor

Audrey Ryan 1992

Help stamp out stolen equipment -

keep a record of all your equipment serial numbers in a safe place.

Silent Keys

Due to increasing space demands obituaries must be no longer than 200 words.

The WIA regrets to announce the recent passing of:

A	Cutting	VK2AAC
W T (Bill)	Wilson	VK3DXE
M (Merv)	Busch	VK3LL
G (Graham)	Phillis	VK5AGP

Graham Phillis VK5AGP

Belatedly I wish to advise on the passing of my next-door neighbour and friend Mr Graham Phillis VK5AGP.

On Tuesday afternoon, 30 July 1991, while riding his motor cycle to work for the afternoon shift at the Pasminco BHAS Smelting Works, he was struck by a car entering the main road from a side street, and died shortly after. This was more than tragic, as Graham was only 52 years of age.

Graham was a quiet achiever, and followed his hobby for a number of years. He did spend some time with his own radio and TV business, which he finally quit to go into the smelting works. He was keen on building his own equipment and always had some radio project or other under way. Amateur TV was one of his interests and he was more interested in getting something going than operating.

He was a member of the Port Pirie Amateur Radio Club for some years, and he was also a very keen breeder of birds.

He is survived by his wife Raylene, a son 24 years, and twin daughters 21 years.

Brian Condon VK5CO

Bill Wilson VK3DXE

It is with deep regret I advise the passing of a good friend, Bill Wilson VK3DXE.

Bill gave great service as a Victorian Division Councillor in years gone by, and I will always remember him as the very first "full call" I had a contact with after I gained my call VK3YXX.

Bill was a man's man - a true "rough diamond" with a heart of gold, and always ready to help a fellow amateur.

Bill became ill a relatively short time ago whilst at his favourite place - his fishing shack on Big River up in the mountains around Eildon.

After surviving major surgery for a short time, Bill lost the battle with cancer and passed away at his home on Tuesday morning 5 April.

VK3DXE will be well remembered by his many friends, and to his wife Margaret and the family, the Victorian Division Council offers sincere condolences.

Barry Wilton VK3XV
ar

Over To You

All letters from members will be considered for publication but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Technical plagiarism?

The article on Loop Yagis, in *AR* for April, is grossly unfair to me.

The author attributed the design of the Loop Yagi to RSGB.

In fact, the long quad (loop yagi) was designed by me (VK3ALZ).

In *AR* for June 1967 is an article by me entitled "Long Quads for 144, 432, 1296 MC". The article details the advantages of the long quad over the long yagi, and shows both square and circular element designs.

Some years later (1970 on) articles began appearing in overseas magazines with copies or near copies of these designs - without acknowledgement, I might add.

However, *VHF Communications* did have the courtesy to acknowledge my prior work.

What particularly annoys me in respect to the April article is that I have verbally supplied long quad design information for previous Mt Skene expeditions - but no mention of this was made.

Of course, Loop yagis are being sold commercially by the thousand now for 400MHz and above, for which neither I nor *Amateur Radio* will ever see a cent.

I wish to thank Bill Roper VK3ARZ, general manager, for a photocopy of the June 1967 article.

Ian Berwick VK3ALZ
107 Loongana Ave
GLENROY 3046

(Bill Magnusson is most apologetic, Ian, at not being aware of your prior contribution. He based his design on the RSGB information which, as you say, also failed to acknowledge your work. Ed).

A bold suggestion

Adam Maurer's letter in May *AR* is quite right: we should highlight WIA members in the *Callbook*.

After all, we're proud to be members and we pay WIA management to ensure we're provided with services above those available to non-members.

Rather than put a "†" mark against member callsigns, why not do what the phone books do and have them in **bold print?**

And if the non-members scream? Good. Send them a membership application form. A bold printed callsign may cost them less than bold print in the phone book.

Gareth Davey VK2ANF
PO Box 1367
DEE WHY 2099

WICEN again

The Newcastle earthquake brought about major upheavals in the thinking of emergency service providers in New South Wales and beyond. For them, "amateur" communicators (in the sense of "lacking professional skill") are no longer good enough.

In a disaster of Newcastle's proportions, to whom will an emergency management officer entrust his message: the WICEN operator, trained in emergency traffic handling procedures and wearing the recognised uniform of an accredited emergency services support group, or the guy who slouches up in thongs and stubbies with an HT, saying "I have a radio; I want to help."?

If Mr Ellis questions the relevance of WICEN, perhaps he should ask why WICEN is being written into every Disaster Management Plan in the state of New South Wales.

As for membership fees, is $10 a year more than his community spirit is worth?

Procedures: they're the same ones used by the other emergency services.

Exercises: doesn't Mr Ellis recognise the value of training?

If Mr Ellis is left at home when disaster strikes, it will be because he is not a *member of an accredited emergency service or support group*. If he tries to interfere, or "help out", he will be committing an offence under NSW law.

The thousands of dollars worth of time, service and equipment provided by dedicated WICEN members goes a long way towards justifying usage of radio spectrum worth $1 million/megaHertz. By comparison, keeping one's local repeater warm all day with idle chat about the weather contributes even less than the pittance we pay in licence fees.

When I put on my WICEN uniform, I stop being an "amateur" and become a "volunteer professional communicator". When lives and property are at stake, we must settle for nothing less.

Richard P Murnane VK2SKY
7/15 Grafton Cres
DEE WHY 2099

WICEN replies

In the April edition, S V Ellis VK2DDL questions the value of WICEN. I know its value!

That's why I joined it years ago, and why I've served the past few of them as president in NSW.

He does not seem to understand that times have changed, and WICEN has changed with them.

When the NSW Rescue & Emergency Management Act of 1989 was proclaimed, all existing rescue and emergency service organisations were given primary and secondary responsibilities.

The NSW Volunteer Rescue Association was included in this review, with two of its specialist squads, WICEN and CREST, accredited by the State Rescue & Emergency Services Board for communication support roles.

The combat agencies have their own dedicated communications systems and WICEN, as a specialist technical support group, reinforces them.

The Act is firm about legal accreditation and responsibility for disaster management, making it a punishable offence for unaccredited organisations to attempt to participate in emergency operations.

WICEN integrates casual volunteer amateurs offering specialist aid, and disaster combat agencies which, in NSW, are co-ordinated by the police.

As VK2DDL correctly points out, DoTC regulations cover emergency operation and, subject to the *control of relevant authorities,* an amateur is entitled to engage in emergency communications. In NSW, authorities recognise only accredited organisations, one of which is WICEN.

WICEN believes that amateurs are not only entitled, but also morally obliged, to help the community in time of crisis, and is the structure through which those with commitment can best function.

VK2DDL said our reception had been cool locally.

It's a pity he didn't look further afield and talk to the commanders in NSW's disaster combat agencies or the people they help.

They're very warm to WICEN!

Ian Nance VK2BIN
22 Truscott St
NORTH RYDE 2113

Metrics please

I have read with interest the article on "Multiband Inverted V for the Z Match Antenna" by Adrian Fell VK2DZF in April *AR*. I do not wish to seem to be "nit picking" but I wish all amateur radio operators would convert themselves to the metric system and not give measurements in the archaic feet and inches. I am the instructor for the novice course run by our local amateur radio club, and teach all newcomers in the metric system. We also refer to the wavelength in metres; we use the formula for converting frequency to wavelength in metres. To make a half-wave dipole, the formula gives us the answer in metres, so **why** give dimensions for antennas etc in feet and inches. Things get complicated enough without mixing "... spacing about 0.72 inch, spreaders every eight inches, and wire size 1mm thick ...".

Although I was brought up on feet and inches (nearly 60 now), I have tried to convert to metric. The younger ones do not learn about feet and inches now so, please, can other writers convert to metric so these youngsters can easily understand. (I haven't even got a measuring stick in feet and inches any more).

Reg Wheller VK4ARW
20 Watson St
HERVEY BAY 4655

(You will have read the letter from 3ZTN last month, Reg, expressing much the same thoughts as yours. As you say, it should be authors who use metric dimensions to begin with. That would make life much easier for us poor editors!)

Zero callsigns

The list below indicates the present operators with VK0 callsigns down "south".

VK0AW	PH Mantel
VK0CE	C Hobbs
VK0CN	P Smyth
VK0DI	D Mehonoshen
VK0KZA	A Cramond
VK0NE	G McDiarmid
VK0ZCM	C Mohring
VK0ZJH	J Hunt

The next crop of callsigns to be issued for operation in the Antarctic and Macquarie Island should appear around next Oct/Nov '92. This will be when the bases are re-supplied during the '92/'93 summer season.

Neil Penfold VK6NE
VK0 QSL manager

No Code Novice

I wish to voice my opposition to the current proposal of no-code novice. The idea is good, but I don't believe that two metres is the answer because 146-148MHz is full enough. Why not give them a portion of six metres, as there are far less operators on this band?

In reply to Les VK4ZLP *(AR* May 1992) how can you say a novice has most full-call privileges and there is no incentive? I think there is a big difference between 30 watts and 400 watts etc (read the regs).

I started studying August 1990 and had my novice by March 1991, I had my full call by November 1991. It was hard work. Novice gave me a taste, which was enough incentive to continue.

Finally, how is it becoming like CB? There are still CW, theory and regulation examinations, and I believe CW is a necessary part of amateur licence examinations.

Rob Owen VK3ICG
PO Box 713
ELTHAM 3095

(Originally it was WIA policy to advocate six metres rather than two for the VHF band common to all licensees. This was changed due to several significant factors, one being the ready availability of 2m equipment. - Ed)
ar.

Help protect our frequencies -

become an intruder watcher today.

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.4	9	7.4	2	-16	-35	...	...
2	8.8	0	6.7	0	-15	-32	...	...
3	8.4	-8	6.5	-1	-15	-32	...	...
4	11.8	0	9.2	2	-2	-11	-27	...
5	18.2	5	14.1	1	5	3	-3	-13
6	23.6	6	18.1	0	8	8	4	-1
7	22.0	6	16.5	0	7	7	2	-4
8	19.3	7	14.5	4	7	5	-2	-11
9	16.1	6	12.0	5	5	0	-10	-23
10	13.2	5	9.9	6	1	-8	-23	...
11	10.9	4	8.1	4	-6	-19	-39	...
12	9.6	7	7.1	3	-13	-30	...	...
13	8.9	12	6.6	1	-19	...	...	...
14	8.7	22	6.4	1	-23	...	...	...
15	8.8	27	6.5	3	-23	...	...	...
16	9.1	29	6.7	5	-21	...	...	...
17	8.7	31	6.6	2	-27	...	...	...
18	8.6	32	6.5	1	-29	...	...	...
19	8.3	32	6.3	0	-31	...	...	...
20	8.1	33	6.3	-1	-33	...	...	...
21	9.0	31	6.9	4	-24	...	...	...
22	8.6	30	6.7	1	-28	...	...	...
23	8.1	22	6.3	-3	-32	...	...	...
24	7.9	12	6.3	-4	-29	...	...	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.2	21	7.0	5	-17	-39	...	...
2	8.9	13	6.9	2	-18	-39	...	...
3	12.3	14	9.1	11	0	-12	-31	...
4	18.7	13	14.4	15	14	8	0	-12
5	23.1	9	18.7	9	13	12	6	-1
6	24.9	8	20.1	6	12	12	8	2
7	23.5	8	18.9	5	11	10	6	-1
8	21.4	8	17.0	7	11	9	2	-6
9	18.6	9	14.7	9	9	5	-4	-15
10	15.6	9	12.2	9	5	-2	-14	-30
11	13.0	9	10.1	8	0	-12	-29	...
12	10.8	10	8.4	5	-9	-25	...	...
13	9.6	13	7.4	3	-17	-38	...	...
14	9.1	21	7.0	1	-24	...	...	...
15	9.1	26	7.0	2	-25	...	...	...
16	9.3	28	7.1	3	-24	...	...	...
17	9.3	30	7.1	4	-23	...	...	...
18	9.2	31	7.0	5	-23	...	...	...
19	9.0	31	7.0	2	-27	...	...	...
20	8.5	31	6.6	-2	-34	...	...	...
21	8.4	31	6.6	-3	-35	...	...	...
22	9.2	31	7.1	5	-23	...	...	...
23	8.6	31	6.7	0	-29	...	...	...
24	8.5	26	6.7	0	-29	...	...	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.0	25	6.9	5	-20	...	...	...
2	8.6	15	6.7	1	-21	...	...	...
3	12.3	12	9.2	10	0	-12	-31	...
4	19.1	12	14.8	13	13	8	0	-12
5	25.1	9	19.3	9	14	14	9	3
6	26.7	8	20.0	4	12	13	10	5
7	26.3	7	19.7	3	11	12	9	4
8	25.0	7	18.8	3	10	11	7	1
9	22.8	8	17.1	4	10	9	4	-2
10	20.0	9	15.0	8	11	7	0	-10
11	16.6	11	12.5	11	9	2	-9	-23
12	13.6	12	10.2	12	3	-7	-24	...
13	11.2	17	8.4	11	-4	-21	...	...
14	9.8	23	7.3	8	-14	-36	...	...
15	9.0	28	6.7	4	-22	...	...	...
16	8.7	31	6.5	3	-25	...	...	...
17	8.9	32	6.7	5	-23	...	...	...
18	9.3	33	6.9	7	-20	...	...	...
19	9.4	33	7.1	8	-18	...	...	...
20	9.2	33	7.0	6	-21	...	...	...
21	8.5	34	6.5	1	-29	...	...	...
22	8.4	34	6.4	0	-31	...	...	...
23	8.6	34	6.5	2	-27	...	...	...
24	8.4	33	6.5	1	-29	...	...	...

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.1	11	21.0	8	16	17	14	9
2	26.3	11	21.1	6	15	16	13	8
3	26.0	11	19.8	6	14	15	13	8
4	26.3	11	20.7	7	15	16	13	8
5	26.9	11	20.8	9	16	17	14	9
6	26.5	11	20.2	13	18	18	14	8
7	24.7	13	18.9	18	20	18	12	4
8	22.2	15	16.9	25	23	17	8	-2
9	19.8	18	15.2	31	23	14	1	-11
10	17.5	21	13.3	31	18	6	-10	-29
11	15.9	22	12.1	28	13	-1	-21	...
12	14.8	23	11.2	25	8	-8	-31	...
13	14.0	24	10.6	23	4	-14	...	...
14	13.5	25	10.3	21	0	-19	...	...
15	12.9	25	9.8	18	-4	-25	...	...
16	12.7	25	9.7	17	-5	-27	...	...
17	11.3	26	8.7	9	-18	...	...	...
18	9.3	28	7.2	-7	...	...	...	...
19	8.9	28	6.9	-13	...	...	...	...
20	12.6	25	9.5	17	-6	-29	...	...
21	17.1	20	13.3	28	17	6	-9	-26
22	21.8	16	18.4	22	23	20	14	6
23	27.6	13	21.3	16	21	20	17	11
24	27.9	11	21.3	11	18	18	15	10

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.6	9	18.0	5	12	11	7	0
2	23.3	10	18.6	3	11	12	8	2
3	23.4	10	17.8	2	11	12	8	2
4	23.9	10	18.8	3	11	12	9	3
5	24.4	9	18.6	5	12	12	9	3
6	23.6	10	17.8	8	14	12	8	0
7	21.7	10	16.4	13	14	11	4	-5
8	19.2	13	14.5	19	15	8	-3	-16
9	16.2	17	12.2	22	10	-2	-20	...
10	13.5	20	10.2	17	-2	-21	...	...
11	11.2	21	8.4	5	-22	...	...	...
12	9.8	23	7.4	-6	...	...	...	...
13	9.0	25	6.8	-15	...	...	...	...
14	8.6	25	6.5	-21	...	...	...	...
15	8.7	25	6.5	-20	...	...	...	...
16	9.0	25	6.7	-16	...	...	...	...
17	9.2	25	7.0	-13	...	...	...	...
18	8.8	25	6.7	-19	...	...	...	...
19	7.9	26	6.1	-32	...	...	...	...
20	7.8	26	6.0	-35	...	...	...	...
21	10.0	25	7.8	-4	...	...	...	...
22	14.3	11	11.0	11	0	-13	-33	...
23	18.8	9	14.5	11	10	5	-5	-18
24	22.0	9	16.9	8	12	10	4	-4

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.0	12	20.0	14	19	18	14	8
2	26.2	12	20.1	11	17	17	13	8
3	25.6	12	19.8	9	16	16	13	7
4	25.3	11	19.9	8	15	15	12	6
5	25.5	11	19.5	9	16	16	12	6
6	25.7	11	19.6	11	17	16	13	6
7	25.8	12	19.7	14	19	18	14	7
8	24.9	13	19.0	18	21	19	13	5
9	23.1	15	17.7	25	23	19	11	1
10	20.7	20	15.7	36	27	18	5	-9
11	18.3	21	14.0	34	21	10	-6	-24
12	16.1	22	12.3	29	13	-1	-22	...
13	14.6	23	11.1	24	5	-12	-37	...
14	13.6	23	10.3	20	-1	-22	...	...
15	12.9	23	9.8	17	-6	-29	...	...
16	12.5	24	9.6	14	-10	-34	...	...
17	12.0	24	9.1	11	-15	...	...	...
18	11.9	24	9.1	11	-16	...	...	...
19	10.7	25	8.2	1	-32	...	...	...
20	8.9	26	6.9	-19	...	...	...	...
21	8.5	26	6.6	-25	...	...	...	...
22	11.9	18	9.0	7	-15	-39	...	...
23	18.1	14	14.1	20	14	5	-8	-24
24	23.4	13	18.1	17	19	16	10	1

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.4	8	21.0	-14	2	7	8	5
2	24.6	10	19.8	-4	8	11	10	7
3	23.5	14	18.8	8	15	15	13	8
4	22.4	18	17.9	20	22	20	14	8
5	21.9	22	17.4	31	28	24	16	8
6	21.4	24	16.9	36	30	24	15	5
7	20.8	21	15.8	35	27	19	8	-4
8	18.1	23	13.7	31	23	12	-1	-17
9	15.6	25	11.8	30	16	3	-14	-34
10	13.9	27	10.5	26	10	-5	-26	...
11	12.8	28	9.6	22	4	-12	-36	...
12	12.1	28	9.1	20	0	-18	...	...
13	11.7	25	8.7	16	-2	-21	...	...
14	11.4	18	8.6	11	-4	-21	...	...
15	11.4	11	8.7	8	-4	-18	...	...
16	10.4	0	8.0	2	-8	-22	...	...
17	8.9	-14	6.8	-2	-12	-27	...	...
18	8.6	-23	6.7	-2	-11	-23	...	...
19	11.8	-12	9.2	-4	-4	-10	-23	-38
20	17.9	-1	13.9	-11	-1	0	-5	-11
21	23.5	2	18.1	-18	-2	2	2	-1
22	25.1	4	20.1	-22	-3	1	4	2
23	25.3	5	20.6	-22	-3	3	5	3
24	25.5	6	20.7	-19	-1	4	6	4

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.4	9	22.5	-11	4	9	10	8
2	26.4	12	21.3	0	11	14	13	10
3	24.9	16	20.0	13	19	19	16	12
4	23.6	20	18.9	25	26	23	18	11
5	23.1	21	18.3	34	30	25	17	9
6	21.8	20	16.3	35	28	21	11	0
7	18.1	23	13.5	33	23	13	0	-16
8	14.8	26	11.0	28	13	0	-18	-39
9	12.2	28	9.0	20	1	-17	...	...
10	10.6	30	7.8	13	-10	-32	...	...
11	9.7	30	7.1	7	-19	...	...	...
12	9.3	31	6.9	5	-22	...	...	...
13	9.5	27	7.1	6	-19	...	...	...
14	9.8	17	7.3	5	-14	-34	...	...
15	10.2	9	7.6	5	-10	-27	...	...
16	9.7	-1	7.3	1	-10	-25	...	...
17	9.0	-12	6.8	-1	-11	-25	...	...
18	8.8	-20	6.8	-1	-9	-22	...	...
19	11.1	-11	8.1	-3	-4	-12	-25	...
20	15.5	-3	11.9	-7	-1	-2	-9	-20
21	20.6	1	15.8	-13	0	2	0	-6
22	24.5	3	18.7	-18	-1	3	3	0
23	26.8	5	20.3	-19	-1	4	5	3
24	27.8	6	21.2	-17	0	6	7	6

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.2	6	20.0	-24	-3	3	6	5
2	23.6	8	19.0	-18	0	6	8	6
3	22.7	10	18.2	-9	5	9	9	6
4	21.9	13	17.4	1	11	13	11	6
5	21.3	16	17.0	11	17	16	13	7
6	20.8	21	16.4	22	23	20	14	7
7	20.0	25	16.2	31	28	23	15	6
8	18.9	28	14.8	36	30	23	13	2
9	17.9	27	13.9	35	26	18	5	-8
10	15.9	27	12.0	32	20	8	-8	-26
11	13.3	30	10.0	27	11	-4	-25	...
12	11.8	31	8.8	21	2	-16	...	...
13	10.8	29	8.1	16	-4	-23	...	...
14	10.3	20	7.7	11	-6	-25	...	...
15	10.2	13	7.8	8	-6	-22	...	...
16	10.4	4	7.8	6	-4	-17	-37	...
17	10.7	-2	8.0	4	-2	-13	-30	...
18	10.0	-11	7.6	1	-3	-13	-29	...
19	9.0	-23	6.9	0	-4	-14	-30	...
20	8.8	...	6.8	-11	-14	-24	...	...
21	11.5	-18	8.5	-4	-1	-5	-14	-27
22	16.7	-4	12.9	-14	-2	0	-4	-11
23	22.0	1	16.9	-22	-4	1	1	-1
24	24.2	4	19.5	-26	-5	2	4	2

VK EAST - USA/CARIBBEAN

VK STH - USA/CARIBBEAN

VK WEST - USA/CARIBBEAN

APOGEE ARTS

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.0	8	12.9	4	8	6	-1	-10
2	17.1	2	12.8	-5	3	3	-1	-9
3	19.6	2	14.6	-13	0	3	1	-3
4	22.7	4	17.2	-20	-2	3	4	1
5	24.4	5	18.7	-23	-4	2	5	3
6	24.8	4	19.4	-24	-4	2	4	3
7	25.2	4	19.5	-21	-3	3	4	1
8	23.2	3	17.7	-15	0	3	3	-1
9	20.2	3	15.2	-8	2	3	0	-7
10	17.3	3	13.1	-2	3	1	-5	-15
11	14.8	3	11.2	2	3	-3	-13	-27
12	13.2	5	10.0	6	1	-7	-22	...
13	12.1	9	9.1	8	-1	-13	-32	...
14	11.6	15	8.7	10	-3	-18	...	...
15	11.3	22	8.6	13	-4	-22	...	...
16	11.3	26	8.5	15	-5	-24	...	...
17	11.4	27	8.6	16	-4	-23	...	...
18	10.5	29	8.0	12	-11	-33	...	...
19	9.1	31	7.0	4	-24	...	...	...
20	8.9	31	6.8	2	-28	...	...	...
21	11.9	29	8.9	19	0	-19	...	...
22	15.3	26	11.8	29	18	7	-8	-26
23	14.6	20	11.2	20	12	2	-12	-29
24	18.0	15	13.8	15	15	11	3	-7

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.0	14	12.9	15	13	8	-1	-12
2	16.9	7	12.8	3	7	5	-2	-11
3	19.6	5	14.4	-7	1	5	2	-4
4	22.9	5	17.4	-15	0	5	5	2
5	24.6	5	19.0	-19	-1	4	5	3
6	24.9	5	19.5	-21	-2	3	5	4
7	25.3	5	19.8	-20	-2	3	5	2
8	24.0	4	18.0	-15	0	4	3	0
9	21.1	3	15.8	-9	2	3	0	-5
10	17.5	2	13.1	-3	3	1	-5	-15
11	14.4	1	10.8	1	1	-5	-16	-30
12	11.8	1	8.8	3	-4	-14	-31	...
13	10.3	4	7.7	3	-10	-26	...	...
14	9.5	10	7.0	2	-17	-38	...	...
15	9.2	19	6.8	1	-23	...	...	...
16	9.4	25	6.9	3	-23	...	...	...
17	9.8	27	7.2	6	-20	...	...	...
18	10.1	29	7.5	8	-17	...	...	...
19	9.7	30	7.3	5	-22	...	...	...
20	8.9	30	6.8	0	-30	...	...	...
21	8.8	30	6.8	-1	-32	...	...	...
22	10.9	29	8.4	13	-10	-32	...	...
23	11.8	28	9.1	18	0	-19	...	...
24	16.0	20	12.1	23	15	5	-9	-25

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.6	18	11.8	20	13	4	-8	-24
2	15.6	10	11.8	9	8	2	-8	-21
3	17.9	6	14.1	0	6	4	-1	-10
4	20.8	6	15.8	-6	4	6	3	-2
5	22.3	5	17.2	-11	2	5	4	0
6	22.6	5	17.8	-14	1	4	4	0
7	23.0	5	18.4	-14	0	4	4	0
8	24.2	4	18.7	-13	1	4	3	0
9	23.1	4	17.6	-10	2	4	2	-2
10	20.9	4	15.9	-4	4	4	0	-7
11	18.1	5	13.7	2	5	2	-6	-16
12	15.5	6	11.8	6	3	-3	-15	-30
13	13.3	8	10.0	8	0	-12	-29	...
14	11.8	13	8.9	8	-6	-22	...	...
15	10.9	19	8.2	8	-12	-33	...	...
16	10.4	24	7.8	7	-17	...	...	...
17	10.2	26	7.8	6	-19	...	...	...
18	10.2	28	7.7	6	-20	...	...	...
19	10.3	28	7.8	7	-19	...	...	...
20	9.6	29	7.3	2	-27	...	...	...
21	8.4	30	6.4	-8	...	...	...	...
22	8.1	30	6.3	-11	...	...	...	...
23	10.8	28	8.1	10	-14	-38	...	...
24	13.5	26	10.4	24	8	-6	-26	...

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.4	17	11.8	18	17	12	4	-5
2	16.4	18	11.2	19	16	11	1	-10
3	15.5	20	10.6	21	16	9	-1	-14
4	14.8	24	10.2	24	17	8	-4	-19
5	14.9	24	10.3	25	17	8	-4	-18
6	15.6	24	10.8	26	19	11	-1	-14
7	16.5	20	11.8	24	17	9	-3	-17
8	14.1	15	10.5	15	7	-2	-16	-33
9	11.6	5	8.6	6	-1	-11	-28	...
10	10.1	-6	7.5	2	-5	-15	-32	...
11	9.3	-16	6.8	0	-5	-15	-31	...
12	9.0	-26	6.6	-2	-6	-14	-29	...
13	9.2	...	6.8	-11	-12	-20	-34	...
14	9.4	...	6.9	-16	-15	-22	-35	...
15	9.7	...	7.2	-19	-17	-22	-35	...
16	9.3	...	7.0	-27	-24	-31	...	...
17	8.6	...	6.5	-34	-33	...	...	...
18	8.4	...	6.5	-33	-33	...	...	...
19	10.4	-35	7.6	-12	-9	-14	-24	-38
20	14.3	-7	11.0	-7	-1	-3	-9	-19
21	18.9	3	13.8	-5	2	3	-1	-8
22	19.6	10	13.4	3	10	10	6	0
23	19.0	14	13.0	11	14	12	6	0
24	18.2	16	12.4	15	16	12	6	-2

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.2	14	11.2	14	13	8	0	-10
2	15.3	18	10.7	18	14	7	-3	-15
3	14.6	21	10.2	21	14	6	-6	-20
4	14.1	26	9.9	26	15	5	-9	-26
5	14.2	25	10.1	25	15	5	-8	-24
6	14.8	24	10.6	25	16	7	-5	-20
7	16.0	19	11.4	22	13	4	-10	-26
8	13.2	14	10.3	13	3	-8	-24	...
9	10.9	6	8.5	5	-5	-18	-37	...
10	9.7	-3	7.5	1	-9	-22	...	...
11	9.0	-12	6.9	0	-8	-21	...	...
12	8.9	-19	6.8	-1	-7	-18	-35	...
13	9.1	-36	7.1	-10	-14	-24	...	...
14	9.2	...	7.1	-19	-20	-29	...	...
15	9.4	...	7.2	-26	-25	-33	...	...
16	8.9	...	6.9	-38	-37	...	...	...
17	8.4	...	6.5	...	...	...	...	...
18	8.2	...	6.5	...	...	...	...	...
19	9.7	...	7.4	-35	-31	-37	...	...
20	12.6	-16	10.0	-9	-3	-4	-11	-21
21	16.5	-5	13.2	-13	-1	-2	-6	-13
22	18.3	0	12.8	-11	0	1	0	-6
23	17.7	4	12.3	-3	4	5	1	-5
24	16.9	10	11.8	7	10	7	1	-7

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.8	5	11.0	3	5	2	-4	-11
2	14.9	8	10.5	7	7	2	-7	-18
3	14.3	9	10.1	9	7	1	-9	-22
4	13.8	12	9.8	12	7	0	-12	-26
5	14.0	13	10.0	13	8	1	-11	-25
6	14.5	14	10.4	14	9	2	-8	-21
7	15.6	15	11.2	15	12	6	-4	-16
8	16.8	15	12.1	15	13	8	0	-10
9	16.2	10	12.1	11	7	1	-10	-22
10	13.4	3	9.9	3	0	-7	-20	-35
11	11.0	-7	8.2	-1	-5	-14	-28	...
12	9.7	-18	7.2	-3	-7	-16	-30	...
13	9.0	-34	6.6	-9	-12	-21	-36	...
14	8.8	...	6.5	-20	-22	-31	...	...
15	9.0	...	6.7	-28	-27	-35	...	...
16	9.2	...	6.8	-34	-31	-38	...	...
17	9.4	...	7.0	-38	-33	-38	...	...
18	9.0	...	6.8	...	...	...	...	...
19	8.4	...	6.4	...	...	...	...	...
20	8.3	...	6.3	...	...	...	...	...
21	9.9	...	7.2	-25	-22	-27	-39	...
22	13.2	-14	10.2	-10	-5	-7	-13	-23
23	17.2	-3	12.1	-11	-2	-2	-7	-14
24	16.5	0	11.5	-4	2	1	-3	-11

VK WEST - EUROPE L.P.

APOGEE ARTS

MFJ

Tapped inductor antenna tuners Full of features yet budget priced!

MFJ949D 300W

$325.00

- Full 1.8-30MHz coverage
- Peak and average reading crossed needle SWR/Power meter
- Built in 300W dummy load
- 6 position antenna switch
- 4:1 balun for balanced lines or long wires
- Full 12 month warranty

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The built-in 300W dummy load makes tuning *sooo* easy! It helps to reduce needless QRM, protects your finals and you'll find it invaluable for testing and adjusting transceivers.

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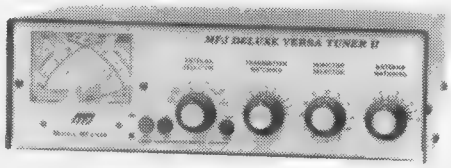

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300W

$280

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● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office, please ... 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

IBM-PC CLONES. AMTOR/RTTY/CW/FAX/SSTV. Your selection of modes supplied in one comprehensive program. Details from VK4ASB, 23 Darwin St, Aspley Qld 4034. Tel AH: (07) 263 8689.

FOR SALE ACT

● YAESU FT767 70cm 2m 6m & HF TX/RX all band RX plus FL7000 YAESU HF LINEAR 160-10m, both for $4500 ono. Phil VK1PJ (06) 292 3260 (H), (06) 280 5966 (W).

FOR SALE — NSW

● KENWOOD TS400S HF txvr EC with voice mic, batt cable, manual $1650. Max VK2GE QTHR (065) 85 5732.

● TWO RF CONCEPTS "Fourth Generation" solid state power amps for 2m and 70cm. Both feature state-of-the-art GaAs-FET preamps, variable SSB delay, high SWR protection, over temperature protection, automatic or remote keying and remote control. All modes of transmission, including FM CW and SSB. Input 200mW to 50W output up to 170 watts. Brand new. A steal at $595 each. AR1000 scanner, wide range portable monitor receiver, 8-1300MHz. Full features, $395. VK2XJC, (02) 388 1081 (H), (02) 963 6915 (B).

● KENWOOD TS 120S VFO120 AT120 MB100 service manual, all VGC. Yaesu VFO FV107, new, the lot $700. Robin L20423 QTHR (069) 63 9232.

● SHACK clearance - 10m tower, 2m HF trans, HF Yagi; 2 teleprinters with encod & decod, ATV TX; BWD. CRO; Yaesu FT101ZD HF trans DS plus 2m trans plus range of other equip. Prices on enq. John VK2CJV AH (02) 809 5024.

● DECEASED ESTATE. Offers in WRITING (letter or fax) are invited for the following equipment: YAESU FT901DM HF xcvr (#9G081234); digital & analogue display, 180W, SSB. 80W AM, FM & FSK; 240V AC & 13V DC; incl YD148 desk mic. YAESU FL2100B HF linear amp (#7G170092). KENWOOD TR7400A 2m FM xcvr (#650626); PLL 5kHz steps; 5/25W output; incl mobile mounting cradle & mic. CDE HAM III (Series 2) antenna rotator, control box & electronic directional indicator; 240V; suitable for arrays up to 12.5 sq ft of wind surface area.LEADER LCG-392 PAL TV pattern generator (#2080068); 240V; B&W & colour dots, cross-hatch & rainbow patterns; video & RF (50-80MHz) output. (No handbooks etc). HEWLETT-PACKARD 410C electronic voltmeter (#344-01014); 240V; measures AC/DC voltage, RF voltage to 700MHz, DC current & resistance. HEWLETT-PACKARD HP5024A digital logic tool kit; HP545A logic probe (TTL 80MHz, CMOS 40MHz), HP546A logic pulser & HP547A current tracer; incl carry case & application notes. PROMAX MC160 TV field strength meter (#999); 9V battery pack; max sensitivity 20dBuV; freq range 46-860MHz. AVO VCM3 valve characteristic meter with manuals. B & K 1076-ES television analyst. All above in good working order (no mods) and are complete with operating manuals, technical handbooks, circuit diagrams etc. Successful purchaser will be responsible for collection and cartage. Transmitting gear sold to licensed amateurs only. All offers to buy received by 15 June 1992 will be considered. Contact Bruce Carroll QTHR (063) 62 8702 or fax (063) 62 7950 or QTHR.

FOR SALE — VIC

● YAESU FT101ZD HF txvr with FV101Z ext VFO orig boxes $695. YAESU F5101B HF txvr with FV101 ext VFO with spare new finals, orig boxes, $695 YAESU FT10IB HF TXCVR with FV-101 ext VFO with spare new finals orig boxes $495. $1100 for both rigs. Ray VK3CDR QTHR (03) 726 9222 after 5pm.

● GELOSO EQUIPMENT G222TR TX 2 signal shifters, one with 807 final, other V4/102 brand new in box. Other gear push pull 807 modulator GELOSO handbooks, $100 the lot. Mike VK3KTO QTHR (03) 557 5475.

● PROP PITCH MOTOR $100 or offer. B40 receiver, 650kHz-30MHz. $100 or offer. Ken VK3ACS QTHR (03) 592 5960.

● YAESU FT680R 6m all-mode 10W microphone and mobile mount. Manuals and circuit diagrams, VGC, $440. Also WERNER WULF 6m J-Pole antenna, $60, both VGC. Peter VK3TKG QTHR (053) 68 7293.

● YAESU FT901 DM HF txcvr 160-10m 100W all mode fitted all optional filters. 240 VAC or 12 VDC can be used portable or mobile. Also FV101 DM digital memory VFO, FC 902 antenna tuner, SP901 spkr. EC with handbooks and original packing, $950. GALAXY III txcvr 20-40-80 SSB 150W. All valve unit with external spr, excellent SSB quality. Complete but not working. H'book and circuit supplied, $200. SSB linear kit comprising type 813 tube, 2 ceramic bases, 2 fil transformers and UM3 plate modulation transformer, $200. Alan VK3ADK QTHR (03) 337 7332.

● COLLINS POWER SUPPLY 426U-2 115VAC to 28VDC 100A, handbook, $110. R1051A/B, R1051E, R390/1, R390A, PTR170, ARC51 handbooks, $50 ea. LSG11 signal generator 120kHz to 350MHz, $50. ARC R35A VHF rcvr 108 to 136MHz, $50. David VK3BFB (03) 587 1593.

● COMPLETE DRAKE STATION comprising TR4C tscvr RV4C remote VFO, AC4 power supply, ASTATIC desk mic, manual, spare new finals and other tubes. All equip in as-new cond. $750 lot. Rob VK3JE (060) 37 1262 or (03) 584 5737.

● COLLINS "S" line 75S3C receiver and 32S3A t/mitter, in EC. Rob VK3JE (060) 37 1262.

AWA CAR PHONE junior FM txvr, comes with HT inverter. RX needs attention. With circuit diagram, $20 ono. VK3AJO QTHR (03) 872 3503.

● TS520S KENWOOD txvr, new finals, EC, $500 ono. VK3UI (03) 541 5458 BH.

YAESU FT230R FM 2m mobile rig, 30W/3W output, 10 mems, plus scan. New quick release mounting bracket. Manual EC, $325. Bob VK3BRF QTHR (03) 878 6613.

● COLLINS KWM2 txvr, compl with sep p/supply, EC, $1000. Rob VK3JE (060) 37 1262 or (03) 584 5737.

● EIMAC SK600A air socket sets c/w SK606 chimney, anode clamp & mount kit, $75 per set. Qty top quality parts to suit 4CX250/350 amp builders, incl fil trans, blowers etc. VK3GY QTHR (03) 789 4363.

● ICOM IC751 HF txvr and heavy duty power supply PS30 complete with 2kW key-down commercial grade linear amp. Mint cond. All workshop manuals. Brand new set of extra final tubes for linear. A complete DX station at less than half cost. Enquiries WIA Vic Div Office or AH VK3XV (059) 98 7851.

FOR SALE — QLD

● YAESU FT747GX S/N 8G070357, GC, $600. YAESU FT757 ATU 9J49001 little use, $400. Steve 6-7pm on (07) 261 1711.

● LARGE COLLECTION of new valves, mostly receiving type, some tx: eg QQV03/20 send SSAE (suitable for two A4 sheets) for list. Will sell single or all. VK4FGB QTHR (070) 54 1448.

● 286 MOTHERBOARD, EGA card, true basic with manual & disks (unused), joystick & card (virtually unused). EPSON MX80 compatible printer with 4 unused ribbons. Any reas offer. Phil VK4BVM QTHR (076) 62 8346.

● HANDHELD ICO2A, with Nicad battery and charger. Also ICO2A with alkaline battery pack. Headset HS10 with VOX unit to suit. All new. Reas offers to VK4AVR QTHR.

● DECEASED ESTATE VK4KT: RF ATTENUATOR Dick Smith K6323 $50. FLUKE 8060A multimeter $700. MFJ752 signal enhancer 2 $100. TESTERS Wee Megger 500V $120. DAIWA CN630 140-450MHz SWR $175. Dick Smith transistor tester $25. 1KW TVI low pass filter $50. 432MHz linear amp microwave module MML432/50W $200. LEADER LCR 740 bridge $200.13.8/2A regulated power supply $40. 500W RF transformer $100. DAIWA SWR meter 140-250MHz $100. DAIWA SWR meter 140-250MHz $100. IC735 HF txvr $1300. IC-2KL 500W HF all band linear amp C/W power supply $2000. IC575H 28/50MHz txvr $1900. IC275A 144MHz txvr $1200. IC-AT500 antenna tuner $700. IC-MB12 mobile mounting bracket suits IC-R70, R71A, IC-745 $20. IC-EX2 marker extension terminal $25. MOBILE Mounting bracket for IC221 $10. 2M GaAs-FET preamp $80. SCANNER JIL SX200 $280. LEADER curve tracer $200. IC7072 Interface unit for IC720A $40. IC-275A 144MHz txvr $1400. PS55 20A power supply $415.IC-HM7 dynamic mic $35. AG25 144MHz preamp $150. IC-MB6 mobile mounting bracket to suit 22S $5. IC-MH12 up/down mic $50. IC-4E UHF FM handheld $300. AH32 VHF/UHF mobile antenna c/w AHB-32 boot mount $130. IC-4E 70c handheld $250. AVO meter $500 ono. LEADER high voltage probe $100. DC micro amp meter $200 ono. MEGA solid state $150. FL-44 Crystal filter $50. FL-34 AM filter $40. POWER SUPPLY parts (Moorabbin) $100. IC-FAI antenna $15. RESISTOR substitution box $50. REALISTIC sound level meter $70. HT signal generator 7-11GHz $500. BIRD model 4381 power analyst $1500. UHF LINEAR amp Tokyo Hy-Power 10-80W $350. BIRD watt meter insert 1W 1.1-1.8GHz $100. BIRD watt meter insert 2.5W 1.1-1.8GHz $100. BIRD watt meter insert 50W 400-100MHz $100. BIRD watt meter insert 250W 400-1000MHz $100. BIRD watt meter insert 5W 100-250MHz $100. BIRD watt meter insert 250W 100-250MHz $100. BIRD watt meter insert 1kW 100-250MHz $100. BIRD watt meter insert 2.5kW 95-150MHz $100. BIRD watt meter insert 5W 50-125MHz $100. BIRD watt meter insert 500W 50-125MHz $100. BIRD watt meter insert 1W 110-160MHz $100. BIRD watt meter insert 500W 2-30MHz $100. BIRD watt meter insert 1W 425-850MHz $100. BIRD watt meter insert 1W 2.2-2.3GHz $100. B/W new video camera $350. DAIWA DM3003 digital multimeter $45. COMET 302 5/8 vertical mobile ant 1.2GHz model CA-1200 $80. FOUR only HELIAX connectors ANDREW 45AN unused $100. 2.3GHz transceiver kit LMW 2320TMA, 144P, 2320, 2320 PRE1, UNVLO2, 2320PPI $300. Four roller inductors $100 ea. 2.1-2.3GHz mixer module $500. 2-way 70cm power divider YS-PD 072 $60.

4-WAY 70cm power divider YS-PD 074 $100. 2-WAY power divider 1.2GHz $80. 4-WAY power divider 1.2GHz $120. XRM-1 10GHz receiver mixer $60. XLO-1 local oscillator for 10GHz $40. XTM-1 transmitter mixer 10GHz 2.3GHz power amp kit $70. 1296MHz front end kit $60. 1296MHz mixer kit $60. 144MHz preamp kit $30. EIMAC tube 4X150G Offer. EIMAC electron tube socket SK-620A Offer. EIMAC electron tube socket CF-100 Offer. EIMAC shroud SK-626 Offer. EIMAC valve base socket SK-620 Offer. EIMAC electron tube valve 2039A Offer. EIMAC JAN-7289 valve Offer. SIEMANS RS1007-176 valve Offer. VK POWERMATE 25amp complete kit $200. ICOM ML-12 10W 1200MHz amp & ICOM IC-120 FM TX $700. M2010 transformer $50. SUPERSCOPE D Smith No T1605 c/w spare tips etc $30. R-L-C bridge kit $30. WELLER EC300ID EC1301 soldering station new $270. CAPACITANCE meter kit altronics K2524 $80. 1GHz digital freq meter kit Altronics K2515 $180. Contact Judy Robertson (077) 71 4968 H, (077) 71 6559 W.

● SIEMENS teleprinter, modem SEQTG plus 2 spare recond Siemens, tapes, paper, ribbons, manuals, complete system $150. Ron VK4CRO QTHR (07) 390 7762.

FOR SALE — SA

● YAESU FT7 S/N8G060665 $395. YAESU FT200 S/N 2N335294 $260. Complete set valves for FT200 $60. Valves QQE03/12 and QQE03/20 (with socket) offers. Barry VK5BS QTHR (082) 95 3249.

● ICOM IC-R7000 25MHz to 1.3GHz with scanning antenna and RG-8 cable and connectors. With handbook and receive modification. No gaps! Exc cond $1250 ono. (08) 278 3861 S/N 240843.

● KLM KT34XA six-element tribander $1200 or offer VK5RN (08) 339 1210.

FOR SALE — WA

● VHF/UHF Discone antenna. Stainless steel construction. "N" connector termination. Ex-DoTC, EC $80. Two x 30m rolls of 120-strand 8mm sq conductor. One red, one black. Ideal for high current power supplies and leads. $35 per roll. Renzo VK6ZAQ QTHR (09) 453 3054. Fax (09) 453 3175.

FOR SALE — TAS

● JRC JST-135 txvr, mint cond $2000. NVA88 ex-spkr suit JRC $140. KEN KP12A RF speech processor, built-in AC supply $110. YAESU SP102 ext spkr $105. Above all as new, inc boxes, man. VK7AN (003) 27 1171.

● DAIWA ANTENNA TUNER cross needle WARC bands $150 ono. MFJ TUNER PREAMP for SWL $130. Ph (004) 31 3020.

WANTED — NSW

● KENWOOD model HC10 clock in reas cond. VK2AS QTHR (02) 416 7784.

● COLLINS 32S-3 or 32S-1 tx, 30S-1 amp, 62S-1 converter BUTTERNUT HF-6 vertical, large collections of *CQ*, *QST* and *Ham Radio*. VK2OE (046) 21 2228 evenings.

● KENWOOD SP230 speaker. Garnet VK2CGF QTHR (065) 51 0767.

● DIAGRAM or manual for handheld Yaesu FT202 - all costs paid - eventually. Swap with FT202M manual. Bruno VK2BPO QTHR (02) 713 1831.

WANTED — VIC

● TRANSVERTER 2m or 70cm for Yaesu FT901 series. Fred VK3APA QTHR.

● YO-901 CRO station monitor. Ph (03) 547 0910.

COLLINS MECHANICAL FILTERS 1 500kHz centre/F SYM bandpass 3.1kHz b/width 1 500kHz carrier/F USB 2.4kHz B/W 1 ditto LSB style Y preferred. Maurice VK3AZB QTHR (03) 890 8038.

● COLLINS 75S3C receiver. Will pay good price. Rob VK3JE (060) 37 1262 or (03) 584 5737.

● TYPE F COIL BOX 480-960kHz for HRO Receiver. Will buy or swap for spare type JC 3.5-7.3MHz bandspreadable coil box. Also MN26 BENDIX Compass Receiver. Need not be a goer but tuning gang and coils must be unmodified and in GC. Harold VK3AFQ QTHR (03) 596 2414.

● COLLINS. Any pre-1960 Collins AM CW or SSB equipment, esp RXs 75A-2, 75A-3, 51J-1, 51J-2, 55G-1 pre-selector. TXs 32V-1, 32V-2, 32V-3, KWS-1 any cond acceptable. Good price paid or trade for other Collins models. Also ARRL and Radio Handbooks, any edition to 1990, esp 1930/ 40/50 editions D104 mic, Vibroplex bug. Garry VK3GY QTHR (03) 789 4363.

● ATTENTION chess players! Ever given a thought to chess "on air"? We welcome players of any strength to join us on 3.669MHz 10:30Z Tuesdays. We now cater for novices too on 3.569MHz 10:20Z Tuesdays. 73. Damian VK3EHP.

WANTED — QLD

● BADLY NEED copy of operating instructions and circuit to restore 1959 GELOSO 222TR CW/AM 6 band transmitter. Also any information and circuit for MULLARD VALVE VOLTMETER type 7555/2 0.5V to 500V 7 ranges. Any help appreciated. VK4EF QTHR (07) 366 1803.

WANTED — SA

● 70CM LINEAR AMP solid state, suitable for amateur satellite works. GaAs-FET pre-amp not a necessity but would consider if other types not available. Contact Peter VK5ZPG reverse charges on (085) 56 2608 until 2130hrs lt any day.

WANTED — WA

● A British Electronics Service + Installation Tech (City & Guild Qualified), Holder of Australian Residence visa.

SEEKS EMPLOYMENT IN OR AROUND PERTH AREA.

Currently employed as Telecommunications Tech on local railway and worked on marine electronics including HF, VHF, UHF Comms & Radars, currently working on fibre optic CCTV & DATA Transmission Systems including PABX Programming + UHF Radio System.

Also experienced in Audio Visual Distribution systems + Master Satellite Antenna Systems (TV).

Licensed Amateur Radio Operator since 1981. Arriving in Australia July or August 1992. Please reply to: G0GUS S Fellick, 41 Rosedale Road, Forrest Gate, LONDON E.7.8AU ENGLAND.

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
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State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

Solution to Morseword No 63

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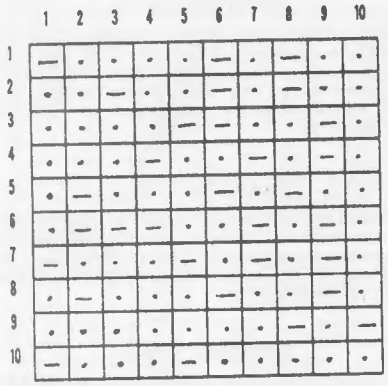

Across: 1 dice; 2 fare; 3 satin; 4 stern; 5 rice; 6 attic; 7 darn; 8 ruin; 9 sift; 10 nines.

Down: 1 beret, 2 saki; 3 ruse; 4 vase; 5 fix; 6 old; 7 vats; 8 grin; 9 image; 10 heir.

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Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

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VK2BWI nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699kHz and 144.950MHz 5wpm, 8wpm, 12wpm

VK3RCW Continuous on 144.950MHz 5wpm, 10wpm

VK4WIT Monday at 0930 UTC on 3535kHz

VK4WCH Wednesday at 1000 UTC on 3535kHz

VK4AV Thursday at 0930 UTC on 3535kHz

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VK6RAP Nightly at 2000 local on 146.700MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555MHz

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